

FULL-LENGTH PRACTICE TESTS 15

English Test

35 Minutes — 50 Questions

Directions: Each passage has certain words and phrases that are underlined and numbered. The questions in the right column will provide alternatives for the underlined segments. Most questions require you to choose the answer that makes the sentence grammatically correct, concise, and relevant. If the word or phrase in the passage is already the correct, concise, and relevant choice, select Choice A, NO CHANGE. Some questions will ask a question about the underlined segment. When a question is presented, choose the best answer.

Some questions will ask about part or all of the passage. These questions do not refer to a specific underlined segment. Instead, these questions will accompany a number in a box.

For each question, choose your answer and fill in the corresponding bubble on your answer sheet. Read the passage once before you answer the questions. You will often need to read several sentences beyond the underlined portion to be able to choose the correct answer. Be sure to read enough to answer each question.

Passage I

A Swimming Change

[1]

Until three years ago, I had never considered myself to be athletically talented. I have never been able to hit, catch, throw, or kick a ball with any degree of confidence or accuracy. For years, physical education being often the ¹ worst part of the school day for me. Units on tennis, touch football, volleyball, and basketball were torturous. I not only dreaded fumbling a pass, so I also ² feared being hit in the face by a ball. However, at the beginning of my freshman year of high school, my attitude toward sports changed.

[2]

Somehow, my good friend Gretchen convinced me to join our schools ³ swim team.

Knowing that I enjoyed swimming, over the course of two summers, it was ⁴ with Gretchen that I practically had lived at the pool.

My mother had insisted ⁵ that I take swimming lessons every summer since I was seven, so I was entirely comfortable in the water. I was also eager to start my high school experience with a new challenge and a new way to think of myself.

[3]

Of course, I had no idea what I was getting into when Gretchen and I showed up for the first day of practice. The team was made up of twenty young women, most of these swimmers had been participating in the community swim team for years. I couldn't do a flip turn at the end of the lane without getting water up my nose. In contrast, most of the other swimmers, who had been swimming competitively, since elementary school, were able to gracefully somersault and begin the next lap. By the end of the first hour of practice, I was exhausted and waterlogged.

[4]

However, I had no intention of giving up. I came back the next day and the next for practice. Things begun to get serious in the second week, when we started the regular schedule of four early-morning and five afternoon practices. Our coach, whom had led the team to several state championships, demanded dedication from everyone on the team. The hard work eventually paid off. By the end of the first month, I had discovered that I was good at the butterfly, a relatively new stroke that was first introduced in the 1930s. I rarely won individual races, but I became a solid member of our team's medley relay.

[5]

After that intimidating first season, I continued swimming. I even will have earned a varsity letter last year. Now I'm hoping to earn a spot in the state competition my senior year. 15

1. A. NO CHANGE
B. education, was
C. education was
D. education,

2. F. NO CHANGE
G. and
H. but
J. though

3. A. NO CHANGE
B. our schools'
C. our school's
D. ours school

4. F. NO CHANGE
- G. Because we had spent two summers practically living at the pool, it was Gretchen who knew that swimming was enjoyed by me.
- H. Having practically lived at the pool over two summers, the two of us, Gretchen knew it was swimming that I enjoyed.
- J. Gretchen knew I enjoyed swimming, as we had spent two summers practically living at the pool.

5. Of the four choices, which is the only one that does NOT indicate that the narrator's mother decided that the narrator must take swimming lessons?

- A. NO CHANGE
- B. suggested
- C. required
- D. demanded

6. F. NO CHANGE
- G. women, the majority of them
- H. women most of them
- J. women, most of whom

7. A. NO CHANGE
- B. had been swimming competitively since elementary school,
- C. had been swimming, competitively since elementary school,
- D. had been swimming competitively since elementary school

8. F. NO CHANGE
G. I came back the next day: and the next for practice.
H. I came back the next day; the next for practice.
J. I came back the next day; and the next for practice.
9. A. NO CHANGE
B. had been begun
C. had began
D. began
10. F. NO CHANGE
G. for whom
H. who
J. which
11. A. NO CHANGE
B. eventually paid off, so, as a result
C. paid off eventually, however, by
D. paid off, eventually, by
12. Assuming each of the following creates a true statement, which provides the information most relevant to the narrator's experience on the swim team?

- F. NO CHANGE
- G. a difficult stroke that interested few other members of our team.
- H. which is faster than the backstroke but somewhat slower than the crawl.
- J. which is still sometimes called the dolphin because it incorporates a two-stroke dolphin kick.

13. A. NO CHANGE
- B. team's medley relay (it consists of four swimmers).
 - C. team's medley relay, which the person swimming backstroke always begins.
 - D. team.

14. F. NO CHANGE
- G. would have earned
 - H. earned
 - J. earn

15. If inserted here, which of the following would be the most appropriate sentence to conclude the essay?

- A. My coach continues to schedule demanding practices, but I have come to enjoy the early-morning swims.
- B. For someone who thought she didn't have any athletic talent, I have come a long way.
- C. Gretchen is also still on the team, but she does not swim the medley relay.
- D. I've always enjoyed swimming, so I'm not all that surprised by my success as an athlete.

Passage II

Exploring Dubuque's Aquarium

[1]

One lazy day last summer, my parents decided that my younger sister and I needed a break from our vacation from academics. They took us to the National Mississippi River Museum and Aquarium in Dubuque, Iowa. I was prepared to be bored by this family educational trip. However, from the moment I walked through the museum's doors, I was captivated; by all that there was to learn about life in the Mississippi.

16

[2]

[1] A large tank stocked with fish and turtles was there to greet us as we walked into the main hall. [2] There were also animals I had never before

17

glimpsed, such as a fish called the long-nosed gar. [3] I was amazed by this fish in particular. [4] Its long, tubular shape and distinctive rod-shaped nose that made it appear like something that lived in the dark depths of the ocean. [5] This first of five freshwater aquariums offered a close-up view of familiar animals that I had seen before, such as ducks. [20]

[3]

In the next aquarium, I see a catfish bigger than I had ever imagined this species could be. According to the posted information, this specimen weighed more than 100 pounds. With its long whiskers and slow, lazy movements, this catfish looked like the grandfather of all the other fish in the tank.

[4]

I couldn't decide which I liked better, the catfish or the long-nosed gar. The next floor-to-ceiling tank, which represented the ecosystem of the Mississippi bayou, held an animal I had never seen: an alligator. At first, I had a hard time spotting the creature—it blended in almost completely with a half-submerged log. [23] Suddenly, though it slid into the water and aimed itself right at the glass separating me from its ferocious claws and skin-tearing teeth. I had a slightly moment of panic before I remembered that, try as it might, this alligator would never successfully hunt tourists like me. As much of the

onlookers squealed in delight as the alligator moved through the tank, I noticed his companion. Far off in a corner slept an enormous snapping turtle. I could imagine no better roommate for the alligator than this hook-beaked turtle with rough ridges running along its shell.

[5]

Despite my initial expectations, I happily spent the entire day soaking up information about creatures that live in the Mississippi River. In one section of the museum, I held a crayfish. [27] Later, I had the opportunity to touch the cool, sleek skin of a stingray, which can be found where the Mississippi empties into the Gulf of Mexico.

[6]

After seeing all, I could inside the museum, I wandered outside, only to find even more exhibits. Having just enough time, it was that I was able to see the otters and watch a riverboat launching, but it was closing time before I was able to see the most impressive thing the museum had to offer. A football-field-sized steamboat from the 1930s is open to tourists. And operates as a “boat-and-breakfast” that hosts overnight guests. I’m hoping that my family will plan another educational trip to Dubuque soon so I can experience life on a steamboat.

16. F. NO CHANGE

G. captivated, by

H. captivated by,

J. captivated by

17. A. NO CHANGE

B. is there

C. are there

D. were there

18. F. NO CHANGE

G. nose, which

H. nose, and this

J. nose

19. A. NO CHANGE

B. animals that were familiar sights to me,

C. familiar animals to which I was no stranger,

D. familiar animals,

20. To make Paragraph 2 coherent and logical, the best placement of Sentence 5 is:

- F. where it is now.
- G. before Sentence 1.
- H. after Sentence 1.
- J. after Sentence 2.

21. A. NO CHANGE
- B. had been seeing
 - C. saw
 - D. spot

22. Which sentence most effectively connects this paragraph to the preceding paragraph?

- F. NO CHANGE
- G. Although the catfish was impressive, it was not the biggest animal on display in the museum.
- H. After seeing the catfish, I was interested in exhibits that were a bit more hands-on.
- J. Until my visit to the museum, I had never really considered what the Mississippi River was like south of my home.

23. At this point, the writer is considering removing the following phrase:

it blended in almost completely with a half-submerged log.

The primary effect of removing this phrase would be:

- A. a smoother transition between sentences.
- B. a greater contrast between images.
- C. a loss of descriptive information.
- D. an increased level of suspense.

24. F. NO CHANGE
G. Suddenly though it
H. Suddenly, though, it,
J. Suddenly, though, it

25. A. NO CHANGE
B. momentarily slight
C. moment of slight
D. momentarily of slight

26. F. NO CHANGE
G. a large amount
H. the many
J. many

27. The writer would like to insert a sentence describing the appearance of the crayfish at this point. Which sentence would best accomplish the writer's goal?

- A. Also known as crawdads, crayfish are close relatives of the lobsters that live in freshwater.
- B. At an average length of three inches, the crayfish looks like a miniature lobster, complete with small but effective front pincers.
- C. Although they are found throughout the United States, crayfish populations are densest in Kentucky and Mississippi.
- D. At first, I was a bit nervous to touch the small creature, but then I relaxed and enjoyed the opportunity to look at it so closely.

28. F. NO CHANGE

- G. all I could inside the museum,
- H. all, I could inside the museum
- J. all I could inside the museum

29. A. NO CHANGE

- B. It was that I had just enough time, so I was able
- C. Having just enough time, it was possible
- D. I had just enough time

30. F. NO CHANGE

- G. tourists and that operates
- H. tourists, it operates
- J. tourists and operates

Passage III

The Mystery Diner

The paragraphs in this essay may or may not follow the most logical order. Each paragraph is numbered, and Question 45 will ask you to determine the best placement of Paragraph 6.

[1]

Although secret identities and elaborate disguises are typically associated with the world of spies and villains, it has other uses. For six years, Ruth Reichl the restaurant critic for the *New York Times*, used aliases and costumes as a regular part of her job.

[2]

Dining is big business in New York City, from the neighborhood noodle shops and diners to the upscale steak houses and four-star French restaurants.

[33] Many of the more than one million people who read the *Times* each day look to it for advice on where to eat. A positive review from the *Times* could have brought a restaurant unimagined success and monthlong waiting lists for reservations. A negative review, on the other hand, can undermine a restaurant's popularity and seriously cut into its profits. Obviously, restaurant owners and workers have a lot at stake when the restaurant critic for the *Times* walks in the door. Waiters and chefs often pull out all the stops to impress the writer that the meal can make or break a restaurant.

[3]

Reichl acutely aware that she received special treatment once restaurant staff recognized her. She would be graciously greeted and led to the best table in the restaurant, offered dishes prepared specially by the head chef, and given multiple courses of amazing desserts. In other words, the dining experience of the restaurant critic was nothing like that of the commonly ordinary person walking in from the street.

[4]

To remedy this, Reichl decided a solution would be to become, for short periods of time, someone else.

Transforming herself into different personas, Reichl used wigs, special makeup, and carefully selected clothing, such as an attractive blonde named Chloe, a redhead named Brenda, and an older woman named Betty. [42]

[5]

Sometimes, Reichl developed a different view about the quality when she was not treated like a very important person of a restaurant. Indeed, the difference between the treatment she received as herself and as one of her characters was occasionally so great that Reichl would revise her initial impression of a restaurant and write a worse review. [44]

[6]

By becoming an average customer, Reichl encouraged even the most expensive and popular restaurants to improve how they treated all of their customers. After all, waiters could never be certain when they were serving the powerful restaurant critic for the *New York Times*.

31. A. NO CHANGE

B. it does have

C. they do have

D. and they have

32. F. NO CHANGE

G. Reichl, the restaurant critic, for the *New York Times*,

H. Reichl, the restaurant critic for the *New York Times*,

J. Reichl the restaurant critic for the *New York Times*

33. Should the following sentence be inserted into the passage at this point?

The legendary French restaurant Le Bernardin received a four-star rating from the *Times* shortly after opening in 1986, an honor it has maintained ever since.

- A. Yes, because the added sentence emphasizes how important a positive review from the *Times* can be.
- B. Yes, because the specific information helps the reader develop a clearer picture of the type of restaurant reviewed by the *Times*.
- C. No, because it is unclear whether Reichl was responsible for reviewing this specific restaurant.
- D. No, because the specific information about one restaurant leads the reader away from the main topic of the essay.

34. F. NO CHANGE

- G. look with
- H. look by
- J. looking to

35. A. NO CHANGE

- B. can bring
- C. will have brought
- D. will be bringing

36. F. NO CHANGE

- G. restaurant owners and workers;
- H. restaurant, owners and workers
- J. restaurant owners, and workers

37. A. NO CHANGE
B. who's
C. whose
D. which
38. F. NO CHANGE
G. Reichl, was acutely aware
H. Reichl very acutely aware
J. Reichl was acutely aware
39. A. NO CHANGE
B. common, representative, and average
C. typical
D. extravagant
40. F. NO CHANGE
G. she created a solution to the problem by becoming,
H. Reichl decided to become,
J. Reichl found a way to fix the problem, which involved becoming,

41. A. NO CHANGE
B. With wigs, special makeup, and carefully selected clothing, Reichl transformed herself into different personas,
C. Transformed with wigs, special makeup, and carefully selected clothing, Reichl's different personas,
D. Reichl used wigs, special makeup, and carefully selected clothing, that transformed herself into different personas,
42. Which of the following true statements would make the most effective and logical conclusion for Paragraph 4?
- F. Reichl found that she could quickly disguise herself as Betty, but it took more time to become Chloe.
G. Her true identity hidden, Reichl would then dine at a restaurant she was currently evaluating.
H. After six years at the *Times*, Reichl moved on to become the editor of *Gourmet* magazine.
J. The former restaurant critic for the *Times* did not always agree with Reichl's methods or her selection of restaurants to review.
43. For the sake of logic and coherence, the underlined portion should be placed:
- A. where it is now.
B. after the word *developed*.
C. after the word *view*.
D. after the word *quality*.

44. Would deleting the word *occasionally* from the previous sentence change the meaning of the sentence?

- F. Yes, because without this word, the reader would not understand that Reichl had different experiences when she dined in disguise.
- G. Yes, because without this word, the reader would think that Reichl always changed her impression of restaurants when she was not recognized and received different treatment as a result.
- H. No, because this word repeats an idea that is already presented in the sentence.
- J. No, because this word is used only to show emphasis, and it does not contribute to the meaning of the sentence.

Question 45 asks about the preceding passage as a whole.

45. To make the passage flow logically and smoothly, the best place for Paragraph 6 is:

- A. where it is now.
- B. after Paragraph 1.
- C. after Paragraph 3.
- D. after Paragraph 4.

Passage IV

The Benefits of a Square-Foot Garden

[1]

[1] I used to start every spring with great hopes for my backyard vegetable garden. [2] After the last freeze in late March or early April, I devoted an entire weekend to preparing the soil in the garden. [3] I thinned out the rows that had too many plants and spent hours tugging out each weed that threatened to rob my little plants of the nutrients they needed to thrive. [4] Once spring truly arrived, I marked out my rows and scattered the packets of seeds that I hoped, would develop into prizewinning vegetables. [5] In the first few weeks of the season, I was almost always in the garden. [47]

[2]

Despite my best intentions, my garden never lived up to the vision I had for it. After I had devoted several weekends to watering and weeding, the garden always started to become more of a burden less of a hobby. By July, the garden was usually in disarray, and I didn't have the energy or time to save it. July and August are always the hottest parts of the year.

49

[3]

This past year, however, my garden was finally the success I had imagined it could be. Instead of planning the traditional garden of closely planted rows that is modeled after large-scale farming, I tried a new technique. My new approach is called square-foot gardening.

51

[4]

A square-foot garden is designed for efficiency. In an ancestral garden, you scatter a packet of seeds down a row. When the plants emerge, they spend hours thinning each row by pulling out at least half of what was planted. In a square-foot garden, you plant each seed individually, there is never a need for thinning. You create the garden plan 1 square foot at a time, until you have a block of 16 squares. Sturdy pieces of lumber which could make effective borders for each square. Walking paths that are at least 2 feet wide separate each 16-square-foot garden. The design is clean and simple, and it eliminates the problem of getting to the rows in the middle of a large garden. In fact, you can do all the weeding, watering, and harvesting from the walking paths.

[5]

In addition to being easier to weed and water, a square-foot garden takes up much less space than a regular garden. I was able to grow an increased number of more vegetables in two square-foot gardens, which took up a total of 32 square feet, than I ever had grown in my traditional garden, which took up 84 square feet. Preparing the soil for the smaller space only required a few hours instead of a whole weekend. There was so much less weeding to do that the task never felt overwhelming. One season of using the square-foot gardening techniques were all it took for me to convert to a completely new outlook on backyard gardening.

46. F. NO CHANGE

G. hoped, would,

H. hoped would,

J. hoped would

47. To make Paragraph 1 more logical and coherent, Sentence 3 should be placed:

A. where it is now.

B. before Sentence 1.

C. after Sentence 1.

D. after Sentence 4.

48. F. NO CHANGE

G. burden:

H. burden and

J. burden, but,

49. A. NO CHANGE

B. The hottest months are July and August.

C. (July, along with August, provides the hottest temperatures of the year.)

D. DELETE the underlined portion.

50. Of the following choices, which would be the LEAST acceptable substitution for the underlined word?

- F. on the other hand
- G. indeed
- H. though
- J. in contrast

Mathematics Test

50 Minutes — 45 Questions

Directions: Choose the correct solution to each question and fill in the corresponding bubble on your answer sheet.

Do not continue to spend time on questions if you get stuck. Solve as many questions as you can before returning to any if time permits.

You may use a calculator on this test for any question you choose. However, some questions may be better solved without a calculator.

Note: Unless otherwise stated, you can assume:

1. Figures are NOT necessarily drawn to scale.
2. Geometric figures are two dimensional.
3. The term *line* indicates a straight line.
4. The term *average* indicates arithmetic mean.

1. What is the value of $8x - 15$ when $x = 9$?

- A. 57
- B. 57
- C. 72
- D. 87

2. If $9y + 14 = 59$, then $y = ?$

- F. 4
- G. 4.5
- H. 5
- J. 6

3. What is 22% of 450?

- A. 90
- B. 88
- C. 95
- D. 99

4. Which of the following is equivalent to $6(3x + 8)$?

- F. $18x + 48$
- G. $3x + 48$
- H. $18x + 14$
- J. $9x + 14$

5. A jacket costs \$84 after a 30% discount. What was the original price?

- A. \$120
- B. \$109.20
- C. \$114
- D. \$100

6. What is the slope of a line passing through points (5, 12) and (11, 36)?

- F. 3
- G. 6
- H. 2
- J. 4

7. If $k(x) = 2x^2 - 6x + 5$, what is $k(4)$?

- A. 9
- B. 13
- C. 13
- D. 21

8. What is the value of $|-23 + 9|$?

- F. -32
- G. 14
- H. 32
- J. -14

9. A triangle has a base of 26 cm and a height of 15 cm. What is its area?

- A. 41 cm^2
- B. 195 cm^2
- C. 390 cm^2
- D. 97.5 cm^2

10. If $8x - 13 = 3x + 32$, then $x = ?$

- F. 6
- G. 8
- H. 9
- J. 11

11. What is the area of a circle with radius 12 cm? (Use $\pi \approx 3.14$)

- A. 75.36 cm^2
- B. 376.8 cm^2
- C. 37.68 cm^2
- D. 452.16 cm^2

12. Which of the following is a factor of $x^2 - 11x + 30$?

- F. $(x - 5)$
- G. $(x - 3)$
- H. $(x + 6)$
- J. $(x - 2)$

13. In a class of 200 students, 85 students play basketball. What percent play basketball?

- A. 42.5%
- B. 40%
- C. 45%
- D. 38%

14. What is the distance between points $(-5, 7)$ and $(7, 7)$ in the coordinate plane?

- F. 2
- G. 0
- H. 14
- J. 12

15. If $\frac{5}{12}$ of a number is 35, what is the number?

- A. 14.58
- B. 70
- C. 84
- D. 60

16. What is the value of 3^5 ?

- F. 15
- G. 243
- H. 81
- J. 125

17. If the sum of five consecutive even integers is 130, what is the middle integer?

- A. 24
- B. 26
- C. 28
- D. 30

18. Which of the following is equivalent to $(x - 12)(x + 4)$?

- F. $x^2 - 8x + 48$
- G. $x^2 + 16x - 48$
- H. $x^2 - 8x - 48$
- J. $x^2 - 16x - 48$

19. A parallelogram has a base of 24 inches and a height of 17 inches. What is its area?

- A. 41 in^2
- B. 82 in^2
- C. 204 in^2
- D. 408 in^2

20. If y varies directly with x^2 , and $y = 48$ when $x = 4$, what is y when $x = 6$?

- F. 108
- G. 72
- H. 96
- J. 144

21. What is the value of $\sqrt{196} - \sqrt{81}$?

- A. 5
- B. 14
- C. 9
- D. $\sqrt{115}$

22. A jar contains 18 red marbles, 12 blue marbles, and 15 green marbles. What is the probability of randomly selecting a green marble?

- F. $\frac{1}{3}$
- G. $\frac{2}{5}$
- H. $\frac{15}{45}$
- J. $\frac{1}{3}$

23. If $\cos(\theta) = \frac{12}{13}$ and θ is an acute angle, what is $\sin(\theta)$?

- A. $\frac{1}{13}$
- B. $\frac{12}{5}$
- C. $\frac{5}{13}$
- D. $\frac{13}{12}$

24. What is the solution set for the inequality $5x + 9 < 44$?

- F. $x < 53$
- G. $x < 7$
- H. $x > 7$
- J. $x < 35$

25. A cylinder has a radius of 8 cm and a height of 15 cm. What is its volume?
(Use $\pi \approx 3.14$)

- A. 2,410.4 cm³
- B. 3,014.4 cm³
- C. 376.8 cm³
- D. 1,507.2 cm³

26. A right triangle has one leg of length 24 and a hypotenuse of length 26. What is the length of the other leg?

- F. 2
- G. 5
- H. 10
- J. 8

27. What is the value of $(6x - 7)^2$ when $x = 5$?

- A. 484
- B. 529
- C. 576
- D. 529

28. The sum of the interior angles of a nonagon (9-sided polygon) is:

- F. 1260°
- G. 1080°
- H. 900°
- J. 1440°

29. If $4^{(x-1)} = 256$, what is the value of x ?

- A. 5
- B. 4
- C. 6
- D. 64

30. Which of the following is equivalent to $\sqrt{288}$?

- F. $12\sqrt{2}$
- G. $16\sqrt{2}$
- H. $144\sqrt{2}$
- J. $12\sqrt{2}$

31. In an arithmetic sequence, the first term is 18 and the common difference is 9. What is the 20th term?

- A. 180
- B. 189
- C. 189
- D. 198

32. If matrix $M = \begin{bmatrix} 9 & 6 \\ 5 & 8 \end{bmatrix}$ and matrix $N = \begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$, what is $M + N$?

- F. $\begin{bmatrix} 5 & 3 \\ 3 & 3 \end{bmatrix}$
- G. $\begin{bmatrix} 13 & 9 \\ 7 & 13 \end{bmatrix}$
- H. $\begin{bmatrix} 36 & 18 \\ 10 & 40 \end{bmatrix}$
- J. $\begin{bmatrix} 13 & 3 \\ 7 & 3 \end{bmatrix}$

33. A sphere has a radius of 12 cm. What is its volume? (Use $\pi \approx 3.14$ and $V = \frac{4}{3}\pi r^3$)

- A. 1,808.64 cm³
- B. 7,234.56 cm³
- C. 904.32 cm³
- D. 3,617.28 cm³

34. What is the value of 9! (9 factorial)?

- F. 40,320
- G. 5,040
- H. 362,880
- J. 81

35. For which value of x is the expression $\frac{3x - 12}{x^2 - 16}$ undefined?

- A. $x = 4$ only
- B. $x = -4$ only
- C. $x = 0$
- D. $x = 4$ or $x = -4$

36. If the angles of a triangle are in the ratio 1:3:5, what is the measure of the middle angle?

- F. 60°
- G. 100°
- H. 40°
- J. 20°

37. What is the domain of the function $f(x) = \sqrt{x + 8}$?

- A. $x \geq -8$
- B. $x > -8$
- C. $x \geq 0$
- D. All real numbers

38. If $\log_7(x) = 3$, then $x = ?$

- F. 21
- G. 2,187
- H. 49
- J. 343

39. A rectangular box has dimensions $9 \text{ cm} \times 11 \text{ cm} \times 14 \text{ cm}$. What is its volume?

- A. 34 cm^3
- B. 693 cm^3
- C. $1,386 \text{ cm}^3$
- D. 154 cm^3

40. What is the least common multiple (LCM) of 18 and 30?

- F. 6
- G. 90
- H. 180
- J. 540

41. If $f(x) = 7x + 4$ and $g(x) = x^2 - 6$, what is $g(f(2))$?

- A. 318
- B. 318
- C. 12
- D. 82

42. The arithmetic mean of nine numbers is 36. If eight of the numbers are 32, 35, 38, 40, 34, 37, 33, and 39, what is the ninth number?

- F. 36
- G. 35
- H. 36
- J. 37

43. In a 30-60-90 triangle, if the side opposite the 30° angle is 7, what is the length of the hypotenuse?

- A. $7\sqrt{3}$
- B. $7\sqrt{2}$
- C. 21
- D. 14

44. If x varies inversely with y^3 , and $x = 16$ when $y = 2$, what is x when $y = 4$?

- F. 2
- G. 4
- H. 8
- J. 32

45. What is the greatest common factor (GCF) of 135 and 180?

- A. 45
- B. 15
- C. 30
- D. 90

Reading Test

40 Minutes — 36 Questions

Directions: The Reading Test includes multiple passages. Each passage includes multiple questions. After reading each passage, choose the best answer and fill in the corresponding bubble on your answer sheet. You may review the passages as often as necessary.

Passage 1

PROSE FICTION: This excerpt from a short story describes a conversation between a woman and her husband, who is a twin.

Emily couldn't help but grin broadly after answering the phone. She frequently called us "two peas in a pod," but I'd always felt like anytime we were mentioned outside (5) of my presence, he was "Bruce" and I was "Bruce's twin brother." Because of this, I wasn't surprised to hear my wife giggling uncontrollably as she talked animatedly with to him. Despite the fact she was speaking

(10) to someone genetically identical to me, I couldn't help but wonder if she had ever responded so enthusiastically to one of my stories.

“Okay, I'll tell him. Talk to you soon.”

(15) After Emily hung up, I watched her take a deep, almost wistful breath before walking over to me.

“Bruce seems well,” I said, trying to sound casual. “He told me about the new

(20) job and everything. What did you guys talk about?”

“Not much.” Emily replied. She walked behind my chair and patted my shoulder before sitting on the couch and opening her (25) magazine. It didn't appear as if she were really reading. She seemed to stop and start, pausing and reflecting about something unrelated to the smiling celebrities featured in the article.

(30) “It's funny to think that he knows some of these people,” she said, pointing at her magazine.

I looked at the gleaming teeth and chiseled features of the actors, and then (35) looked over at a picture of Bruce and me resting on the mantel. Looking closely at the photo always made my stomach turn; as with every picture of us, there was an unmistakable vitality in Bruce's face that

(40) wasn't present in mine. It was as if I were wearing a "Bruce" costume; I was trying to mimic one of his trademark smiles, but I always seemed to produce a different failed attempt.

(45) "You all right?" Emily asked, noticing my expression.

I grabbed the picture from the mantel and brought it to her. She looked at it and looked up at me quizzically.

(50) "Can you tell which one is me?" I asked.

She looked back at the picture and pushed her lip out as she looked from one face to the next. After about five seconds she pointed to my face, then turned and looked

(55) at me confidently.

"How could you tell?" I asked.

"Well, it wasn't very hard," she responded. "You are my husband, and I love the way you smile. Bruce looks exactly the (60) same in every picture; it looks practiced. But for you, it always seems like you're thinking about something, even concentrating, to make sure you smile right."

"Really?" I was surprised by how much (65) thought she had put into this.

She took the picture and put it back on the mantel. I could still see the perfection in Bruce's smile and hesitation in mine, but at least Emily found a way to compliment my

(70) insecurities.

Emily went back to perusing her magazine.

“At least you ended up with a Fairholm,” I said, “even if it wasn’t the famous one.”

(75) “Oh, was I supposed to pursue the famous one?” she shot back.

She closed her magazine and put it down on the coffee table. There wasn’t an argument coming, but I saw her disappointment. The problem was not that she actually would have married my brother before me; it was the simple fact that I couldn’t help but believe that to be the case. I saw myself as second to him and always had. With embarrassing relatives, people will always point out that one can’t choose one’s family, but when you’re a twin, it’s not the association that you fear—it’s the comparison.

(85) “Do you want to be where he is?” she inquired, with an empty tone.

“This is exactly where I want to be,” I replied. “I just never know how to explain to people that I’m an insurance adjuster, not a Hollywood agent. They always want to know how it happened when we had the same upbringing and education. They look at me as if I did something wrong.”

“Do you ever call him?” she asked.

“I figure he’s busy, and he calls enough,”

(100) I said.

She cradled her chin in her hand and looked at me in mild disbelief. “You realize that by not calling and turning down his invitations to visit, you make him feel

(105) rejected, right?”

“Come on, Emily. He’s surrounded by famous people—he doesn’t need my approval.”

“Maybe not,” she sighed, “but his favorite (110) stories to tell me aren’t about Hollywood—they’re about you two growing up.”

“Well, he was popular then, too,” I said, shrugging.

“He doesn’t look at it that way,” she (115) responded. “He would give up a lot to have your approval, Dave. He wants to be your brother, not a competitor.”

“It’s okay, Emily. I’ll call him soon, but I think that he’ll be okay either way.”

1. From the author’s point of view, the narrator can best be described as:

- A. consumed by jealousy.
- B. unsuccessful in his career.
- C. lacking in self-esteem.
- D. proud of his place in the family.

2. Emily is best described as:

- F. aloof and ineffectual.
- G. needling and meddlesome.
- H. caring and diplomatic.
- J. pained and inconsolable.

3. Which of the following statements does NOT describe a feeling Dave has toward his brother?

- A. He is jealous of the reaction his brother gets from Emily during their phone conversation.
- B. He believes he would be better suited for his brother's type of work.
- C. He is resentful of his brother's superior social skills.
- D. He is skeptical of his brother's desire for his approval.

4. The primary focus of the first paragraph (lines 1–11) is:

- F. Emily's attempt to make her husband jealous.
- G. Emily's desire for the brothers to resolve their differences.
- H. Dave's hope to distance himself from his twin brother.
- J. Dave's feelings of inferiority to his twin brother.

5. Lines 83–100 (“Do you ever . . . either way.”) suggest that Dave does not contact Bruce because Dave:

- A. believes that Bruce has great need for him but does not want to admit to Emily that she is right.
- B. feels guilty about being distant toward Bruce and worries that he will have to explain himself.
- C. wants to prove to Emily that he is not impressed by Bruce's high-profile job.
- D. still harbors resentment over Bruce getting preferential treatment during their childhood.

6. According to the passage, when Dave looks at the photograph, he sees:

- F. his brother being cruel to him.
- G. two indistinguishable faces.
- H. a comparison unfavorable to him.
- J. his wife paying more attention to Bruce.

7. Which of the following is NOT a basis on which the narrator compares himself with his brother, Bruce?

- A. Fame
- B. Profession
- C. Facial expression
- D. Wealth

8. It can be logically deduced from the passage that Dave and Bruce:

- F. tell Emily different-sounding stories about their shared childhood.
- G. are frequently at odds regarding their different professions.
- H. have often fought over Emily's attention.
- J. were much closer shortly before Bruce moved.

9. Based on the passage, the author would most likely agree that Emily:

- A. should have married Bruce.
- B. is happy in her marriage to Bruce's twin brother.
- C. routinely keeps her phone conversations secret from her husband.
- D. is disappointed that she doesn't know the famous people her brother-in-law knows.

10. According to the passage, the reason Emily tells Dave about the content of Bruce's stories is that Emily:

- F. wants to convince Dave that Bruce does not see himself as better than Dave.
- G. wishes to hear Dave's version of the stories.
- H. sees doing so as a way to make Dave more impressed with his brother.
- J. thinks that doing so will make Dave sympathetic to Bruce's loneliness.

Passage II

SOCIAL SCIENCE: This passage discusses the relationship between the media and public opinion.

Large-scale media can likely be traced back to ancient tribes sharing information about the edibility of berries or the aggressiveness of animals. Despite constant evolution, the information most sought after is that regarding personal safety, personal opportunity, and the triumphs and misdeeds of others—the larger the persona and more laudatory or despicable the act, the better. When a story is of continued national interest, however, the focus shifts even further from facts and more to theater. To step back and compose an objective plot of goings-on is a distant possibility, but establishing the hero or villain of the day is paramount. Ultimately, the public's desire to have cold, dry, and correct facts is virtually nonexistent.

Current newscasts exacerbate this by delivering an assault on the senses with meaningless graphics and theatrical music; meanwhile, the monotone newscaster reads verbatim from a teleprompter, often using phrases identical to those on other networks. Additionally, the viewer has

probably already read the same story on the Internet earlier. When television was limited to three networks, rather than ubiquitous news-only channels, the newscaster (30) was a national figure and audience members would eagerly await information that was new to them, expecting a relatively thorough explanation of any complicated events. For example, to this day many (35) people, in explaining the Watergate scandal to those too young to know of it, use Walter Cronkite's delineation as the basis for their understanding.

The objective, trustworthy anchorperson (40) has also given way to vociferous demagogues promising truth but delivering oversimplified, bias-driven sound-bites. The idea of allowing individuals to draw their own conclusions is notably absent; in fact, many (45) personalities mock those with opinions differing from those presented. The availability of neutral online sources mitigates this slightly, but not to any large degree.

While the actual article may be impartial, (50) electronic periodicals will still sensationalize headlines in order to attract casual readers, and those very headlines sway many readers to certain opinions before the article is even read. For example, if a headline mentions (55) an "enraged public," the reader is far more

likely to both read and take umbrage at the information than he or she would be if the article mentioned a subject that “irked locals.”

- (60) In truth, though, the public is as desirous for dry and objective facts as finicky children are for brussels sprouts. The personalities willing to shrug off accountability in favor of wild accusations and
- (65) bombastic slogans captivate a large demographic, while one would be generous by saying that objective fact-based programs occupy even a niche market. This not only damages the general accuracy of so-called
- (70) news but also further polarizes the public. People now have the option to receive their news from hosts with a variety of political leanings, and one almost invariably chooses to watch the personality with opinions
- (75) closest to one’s own. This is more harmful than convenient because it allows viewers to simply parrot information they are given, eliminating any thought or scrutiny. It is this intellectual laziness that aids in
- (80) distancing the general public from factual information: as a growing number become resigned to accepting whatever their favorite host tells them, the more freedom networks have to pass off sensationalist entertainment
- (85) as news. It boils down to the unfortunate

truth that most are far more likely to accept inaccurate information as fact than to question the legitimacy of something that seems to fit with the opinions they already
(90) hold.

Those who make the news also obfuscate objective facts. A legion of employees is dedicated solely to the purpose of making the decisions of political figures sound
(95) flawless. Oftentimes, important decisions are made, yet throughout a lengthy press conference, not a single factual implication is discussed. The meeting becomes nothing more than an opportunity for political
(100) employees to test their infallible-sounding slogans, while the media dissects the semantics rather than the facts. Semantics, however, are all the media is presented with.

Despite all these methods of prevarica-
(105) tion, people still are better informed than they were in the past. The public often gains knowledge of events minutes, rather than days or weeks, after the fact. The populace has a strong desire for news in general,
(110) and amid all the unscrupulous presentation methods, facts do exist. However, the profitability of news has put a premium on presentation, not trustworthiness. Complicating matters further is the populace's impatience;
(115) the standard consumer would rather be

presented with a minute and potentially inaccurate statement—one that may or may not be retracted the following day—than suffer through a lengthy treatise comprised (120) of all the known facts and nuances of a particular issue. The desire to know still exists, however; it just happens to be overshadowed by the public’s desire for personal consensus and the media’s desire to reel in (125) the public.

11. One of the primary points the author attempts to make regarding the current news media is that:

- A. the media passes off made-up stories as facts.
- B. the news anchors are not as opinionated as they were in decades past.
- C. the media focuses more on presentation than substance.
- D. the media goes directly against what news audiences truly desire to see.

12. In lines 2–3 the author references “the edibility of berries” in order to:

- F. emphasize the need for today’s farmers to plant only edible fruits.
- G. describe a typical wild animal food.
- H. illustrate one kind of information that is always important.
- J. comment on the caveman’s limited diet.

13. The author brings up Walter Cronkite's coverage of Watergate in order to assert that:
- A. Walter Cronkite was a particularly adept newscaster.
 - B. a previous standard for news rightly included clarification of complex issues.
 - C. current newscasters are far more forgettable than those who came before them.
 - D. the expanding number of television channels has made individual newscasters less famous.
14. By stating that "personal consensus" is of great importance to the public (lines 105-106), the author is probably suggesting that members of the public:
- F. do not want information that contradicts their own beliefs.
 - G. work hard to find the source that provides information closest to the truth, despite the difficulties present.
 - H. wish to resolve any moral conflicts they may have with practices in news reporting.
 - J. have difficulty finding news sources reflecting their personal views.
15. According to the passage, what type of news stories are sensationalized the most?

- A. Those with a fairly clear chain of events
- B. Those that stay in the public's consciousness for long periods of time
- C. Those that clearly support one political view
- D. Those with the most nationally-relevant information

16. As it is used in line 12, the word *distant* most nearly means:

- F. separated.
- G. different.
- H. reserved.
- J. unlikely.

17. Based on the passage, which of the following headlines would the author be most likely to criticize?

- A. Earthquake Rocks Small Community, Arouses Questions Regarding Preparedness
- B. New Tax Protested by Idaho Farmers
- C. Parents Across Country Outraged at Offensive Song
- D. Governor Says Proposed Legislation as Too Expensive

18. The author asserts that individuals will often accept potentially inaccurate information because they:

- F. believe that most newscasters are honest.
- G. have no way to research correct facts.
- H. appreciate the opportunity to discuss the information.
- J. have political beliefs similar to those of specific media personalities.

19. In the fourth paragraph, the phrase “even a niche market” (lines 57–58) expresses the author’s feeling that:

- A. media companies are greatly influenced by public demand.
- B. cable television networks are willing to present objective facts.
- C. factual news media should look into better marketing practices.
- D. factual news would be profitable with greater exposure.

20. As it is used in line 34, the word *vociferous* most nearly means:

- F. angry.
- G. incompetent.
- H. humorous.
- J. vehement.

Passage III

HUMANITIES: James Joyce was among the most influential writers of the early twentieth century and one of the leaders of a literary movement that

became known as modernism. The following two passages are excerpted from essays written about Joyce during his lifetime.

Passage A

Although the writer James Joyce has spent the majority of his adult life outside of Ireland, he has always thought of himself as, and will be remembered as, a quintessentially Irish writer. His attachment to the nation, and especially his boyhood home of Dublin, is apparent in his works, which are invariably set in Ireland and often focus on the social and political issues of the Irish. One of his earliest works, a collection of short stories, is even entitled *Dubliners*, and his novel *Ulysses*, which is generally considered his greatest work, depicts 1904 Dublin in almost staggering detail. Joyce was often quoted as saying that, were Dublin to be destroyed in some tremendous calamity, it could be re-created brick by brick from the depictions in *Ulysses*; in reading the novel, one finds it difficult to dispute the claim.

In addition to its focus on Dublin, *Ulysses* is somewhat narrowly focused in other ways as well. Its action takes place on a single day, and for the most part it

is centered on a single protagonist. Its events are not the grand, sweeping historical landmarks found in other novels, such as Tolstoy's *War and Peace*, but (30) rather the mundane events of everyday life; Joyce considered eating, running errands, and even making trips to the lavatory worthy of inclusion in his masterpiece.

(35) And yet, despite its tight focus, the novel is already considered one of the most globally appealing of all time, a powerful representation of the complete human condition. Almost paradoxically, (40) it is the level of detail in Joyce's microcosm of a single man on a single day in a single city that allows him to make statements and observations that apply to humanity as a whole. Perhaps human (45) existence is not best contemplated on the great battlefields of history, which are experienced by only a few human beings for small portions of their lives. It might instead be better expressed in the minor (50) struggles and idle musings of an ordinary Irishman who, by the very virtue of his ordinariness, is able to transcend the impediments of time and place in order to appeal to the entirety of the human (55) dilemma.

Passage B

As one contemplates the state of literature in our modern era, it is hard to resist a longing for the great writers of eras gone by. At times, one must take
(60) great pains merely to remember that there were once authors such as Dante, Shakespeare, or Dickens: authors who were able to relate stories of great travels and struggles even as they compelled
(65) us to mull over the great philosophical questions of all time. They did not waste their time or ours with trivial affairs; their stories were unique and memorable, and they bore repeated readings and
(70) rereadings from generation to generation. These writers never took perverse glee in conveying thoughts and actions that were better off forgotten. They took great care to depict accurately the best
(75) and worst aspects of human nature; they were well aware of the impact their works would have on culture and strove to ensure that they would enhance, rather than degrade, the public's intellect;
(80) they did not resort to tricks or devices in order to garner readership for their writings; and in all these regards, they are firmly distinguished from writers of the present day, the most notorious of which

(85) is the Irish novelist James Joyce.

The goal of art is to enlighten the consciousness of those who partake of it, to lift their minds and souls out of the trenches of ordinary activities and (90) humanity's base instincts. It would seem that modern writers like Joyce have no interest in such enlightenment, instead preferring to revel in every detail of activities that should never have been (95) committed to paper in the first place. In basing his novel *Ulysses* on Homer's *The Odyssey*, Joyce has sullied the very form of the epic genre. Whereas *The Odyssey* was a great tale of a noble hero's struggle (100) against a seemingly insurmountable series of trials in order to restore order and honor to his household, Joyce's book is nearly the direct opposite. The protagonist is no hero, his actions are listless (105) and forgettable, and his obsession with obscene and undignified behavior is virtually nauseating.

It is a pity that Homer's epic hero has now been so distorted by his mere associ- (110) ation with Joyce's antihero. And even more shameful is the waste of talent, for, subject matter aside, Joyce is no slouch as a wordsmith. Sadly, it is the literary world's loss that he was not born in a more dignified

(115) era where his talents could have been
utilized in a more appropriate manner.

Questions 21–23 ask about Passage A.

21. Which of the following, if true, would most significantly weaken the main argument of Passage A?
- A. Historical events are often depicted inaccurately in fictional writing.
 - B. Similar philosophical ideas often arise in cultures that have never had contact with each other.
 - C. People from some cultures find the thoughts and motivations of people in other cultures difficult to comprehend.
 - D. Thorough knowledge of the place where one grew up can lead to a stronger understanding of human nature.
22. Which of the following best conveys the meaning of “transcend . . . place” (lines 42–43)?
- F. Make a specific statement about a particular group of people.
 - G. Write in such a way that precise information is obscured.
 - H. Ignore setting in order to focus solely on character.
 - J. Go beyond surface circumstance to reveal universal truth.
23. Which of the following is NOT a theme in Joyce’s *Ulysses*?

- A. Heroic deeds
- B. Life in Dublin
- C. Everyday common struggles
- D. The human dilemma

Questions 24–26 ask about Passage B.

24. According to Passage B's first paragraph, the author is critical of James Joyce's writing on the grounds that Joyce:

- F. is not as dignified as the great authors of the past.
- G. lacks proper knowledge of his subject matter.
- H. copies too closely from the authors who preceded him.
- J. uses language that is unnecessarily elegant.

25. Though he decries Joyce's writing, the author of Passage B admits Joyce's talent by acknowledging that:

- A. Joyce was a product of his time.
- B. writers cannot overcome the constraints of the period in which they live.
- C. Joyce was a skillful writer.
- D. Joyce's writing is comparable to that of Dickens.

26. As used in line 72, the word *base* most nearly means:

- F. unrefined.
- G. foundational.
- H. nauseating.
- J. sophisticated.

Questions 27–30 ask about both passages.

27. It can be inferred that the author of Passage A would respond to Passage B's assertion that the goal of art is to enlighten by:
- A. providing evidence that Joyce's writing is more enlightened than older works.
 - B. emphasizing the importance of appealing to readers throughout the world.
 - C. agreeing that Joyce's attention to detail diminishes the value of his writing.
 - D. refusing to acknowledge the significance of great philosophical questions.
28. Which of the following best captures the difference between the two authors' views of Joyce's writing?

- F. The author of Passage A despises its lack of importance, while the author of Passage B disparages its inaccuracy.
 - G. The author of Passage A claims that it is insignificant, while the author of Passage B contends that it is obscene.
 - H. The author of Passage A admires its universal appeal, while the author of Passage B deplores its lack of decorum.
 - J. The author of Passage A laments its irrelevance, while the author of Passage B appreciates its craftsmanship.
29. Which of the following word pairs best reflects the perspective of each author on the word “detail” as used in Passage A (line 12) and Passage B (line 75)?
- A. Passage A: entertainment; Passage B: dismay
 - B. Passage A: admiration; Passage B: revulsion
 - C. Passage A: enthusiasm; Passage B: shame
 - D. Passage A: support; Passage B: glee
30. It can be inferred that the author of Passage B would most likely respond to Passage A’s description of Joyce as “a quintessentially Irish writer” (line 4) by:
- F. disagreeing that Joyce was of Irish descent.
 - G. disagreeing that Joyce was an exemplary writer.
 - H. agreeing that Joyce was a champion linguist.
 - J. agreeing that Joyce was an unrelenting mystic.

Passage IV

NATURAL SCIENCE: This passage discusses the degree to which rattlesnakes pose a threat to humans.

In both recorded and oral history, rattlesnakes are categorized as malevolent beings. Their lance-shaped heads and angular browlines make them look the perfect villain,
(5) and their venom cements this classification. Publicized reports of bite victims seem to prove the nefarious nature of rattlesnakes.

Unlike mammalian predators such as bears, rattlesnakes do not have the reputation of an animal deserving human respect.
(10) One imagines the rattlesnake hiding in our backyards, waiting to strike.

In recent long-term studies, however, the social behavior of rattlesnakes has been
(15) found to be quite different than many would expect. Herpetologists, scientists who study snakes, had long suspected a more complex and thoughtful existence for the reptiles and now have hard information to back up
(20) their theories. When examined, the sinister opportunist lurking in the shadows better resembles a mild-mannered domestic.

Unlike the nonvenomous king snake, rattlesnakes are entirely noncannibalistic and
(25) tend to spend their entire lives with a single

mate. The mating ritual in which two males will extend almost half of their bodies off the ground to wrestle is not lethal, and once bested, a rattlesnake peacefully retreats to
(30) find a new den of eligible mates. Female rattlesnakes give birth to live young, and rattlesnakes often share their dens, even hibernating with tortoises without incident.

Sadly, it seems that only those with an
(35) existing fascination with snakes are aware of this socially functional rattlesnake. Another discovery that made little stir in the public consciousness is an experiment in which herpetologists tracked snakes with radio
(40) transmitters and saw their behavior when humans entered their habitat. While a few snakes did hold their ground and rattle, most saw or sensed a disturbance (snakes cannot hear) and immediately headed in
(45) the opposite direction. Many of the snakes that were handled by herpetologists did not coil or strike. This is not to say that a snake will not bite a human if disturbed, but the tendency is to retreat first and give warning
(50) second, before striking becomes a possibility.

Describing a more docile nature does not imply that rattlesnakes would make good pets for children, but considering the aggressiveness often displayed by a South
(55) American pit viper, the fer-de-lance, one

familiar with both would have far less trepidation about passing by a rattlesnake. For one thing, rattlesnakes do coil and rattle, giving humans an opportunity to move
(60) away, while fer-de-lances will often strike at passersby without warning. Furthermore, when it comes down to statistics, American hospitals report an average of 7,000 snakebite patients a year; generally
(65) more than half are actually from nonvenomous snakes thought by victims to be venomous. On average, fewer than six people die of snake envenomation annually, and the vast majority of the serious bites are due
(70) to either handling the snake or stepping on it; most people bitten by snakes they were not engaging end up with very mild bites. Compare this with an average of over one million hospital visits for dog bites and
(75) twenty annual deaths at the jaws of man's best friend. With such minuscule statistics regarding snakebites, it is curious why they are still viewed as unfathomably dangerous, when bees, lightning—and yes, dogs—are
(80) responsible for far more human fatalities. The fer-de-lance, however, is responsible for thousands of deaths annually in Central and South America.

If one is looking for proof that rattle-
(85) snakes do not intend to harm humans, one

should consider perhaps the most stunning evidence regarding bite behavior. Over half of the bites rattlesnakes administer to humans are “dry,” meaning the rattlesnake (90) purposely does not release venom. While I will not posit that this is due to rattlesnakes’ possessing an awareness of the well-being of their non-food-source bite victim, there is a great deal of thought present. The snake (95) acknowledges that venom is needed for immobilizing and digesting prey (venom is actually saliva), producing venom takes time, and the human is not a food source. Therefore, if the snake is not surprised or (100) fearing death, the damage of a rattlesnake bite will likely be far less severe than if the snake used all its venom. This has been known for some time, but in many cases, it is probably better for humans to believe that (105) the snakes are more liberal with venom than they are, simply because a frightened and cornered rattlesnake is very dangerous.

Unfortunately, some people take the traditional view of the rattlesnake and use (110) it as an excuse to harm the animals. People in various areas use the fearsome reputation of rattlesnakes, along with the more docile reality, for profit. Rattlesnake roundups are held, where people collect snakes before- (115) hand and join in a festival celebrating their

conquest. The events are billed as both entertainment and as making surrounding residential areas safer for children; however, the vast majority of snakes are collected (120) from uninhabited areas, and people are frequently bitten at the festivals while handling the snakes for the audience. Eventually, the snakes are killed to make clothing or trophies, and these events are estimated (125) to be responsible for 100,000 rattlesnake deaths annually, in comparison to fewer than 6 human deaths from rattlesnakes.

Behavior like this provides a better reason for a crotalid mythology. With statistics categorically showing a low level of (130) danger from rattlesnakes to humans and an extremely high level vice versa, it would be a wonder to see what human-related folklore rattlesnakes would come up with if they (135) were able to speak or write.

31. In relation to the entire passage, the phrase “the sinister opportunist lurking in the shadows better resembles a mild-mannered domestic” (lines 18-20) most likely implies that:

- A. adult rattlesnakes are considerably less aggressive than juveniles.
- B. recent studies regarding rattlesnakes found few incidents of aggressive behavior.
- C. rattlesnakes are more similar to mammals than once thought.
- D. rattlesnakes are entirely predictable in their behavior.

32. The writer's attitude toward rattlesnakes can best be described as:

- F. apathetic.
- G. solicitous.
- H. affrighted.
- J. antagonistic.

33. What evidence does the passage give regarding the social ability of rattlesnakes?

- A. Rattlesnakes are aware of the uses of their venom.
- B. Wrestling between males establishes a social hierarchy.
- C. Rattlesnakes can share their habitat with other species.
- D. Rattlesnakes rarely eat other snakes.

34. The statement "it would be a wonder to see what human-related folklore rattlesnakes would come up with if they were able to speak or write" (lines 120-122) means that:

- F. humans and rattlesnakes present great risks to each other's safety.
- G. humans and rattlesnakes behave in many similar ways.
- H. humans are a much greater threat to rattlesnakes than rattlesnakes are to humans.
- J. humans have traditionally assigned human emotions to rattlesnakes in folklore.

35. According to the passage, what is the correlation between human behavior and serious rattlesnake bites?
- A. There is no statistical relationship.
 - B. Humans who move with quick motions provoke strikes.
 - C. Humans who actively seek interaction with snakes for entertainment are less likely to receive a “dry” bite.
 - D. Rattlesnakes deliver a variable amount of venom based on how threatening humans act.

36. The author refers to “dry” bites (line 82) in order to:

- F. prove that rattlesnakes make conscious decisions about food sources.
- G. do not produce enough venom to inject into a human.
- H. support his contention that rattlesnakes pose no harm to people. J. indicate that most rattlesnake bites are not as dangerous to

Science Test

40 Minutes — 40 Questions

Directions: The Science Test includes multiple passages. Each passage includes multiple questions. After reading each passage, choose the best answer and fill in the corresponding bubble on your answer sheet. You may review the passages as often as necessary.

You may NOT use a calculator on this test.

Passage I

Glaciers are large masses of ice that move slowly over Earth's surface due to the force of gravity and changes in elevation. Glacial *calving* occurs when 1 edge of a glacier borders a body of water. A calving glacier's *terminus* (the lower edge) periodically produces icebergs as they break away from the glacier and fall into the water.

Study 1

A computer was used to create a model of a typical calving glacier. It was hypothesized that a primary factor determining the calving rate is the

glacier's velocity at its terminus. Figure 1 shows the calving rate, in meters per year, and length of the computer-generated glacier over a period of 2,000 years.

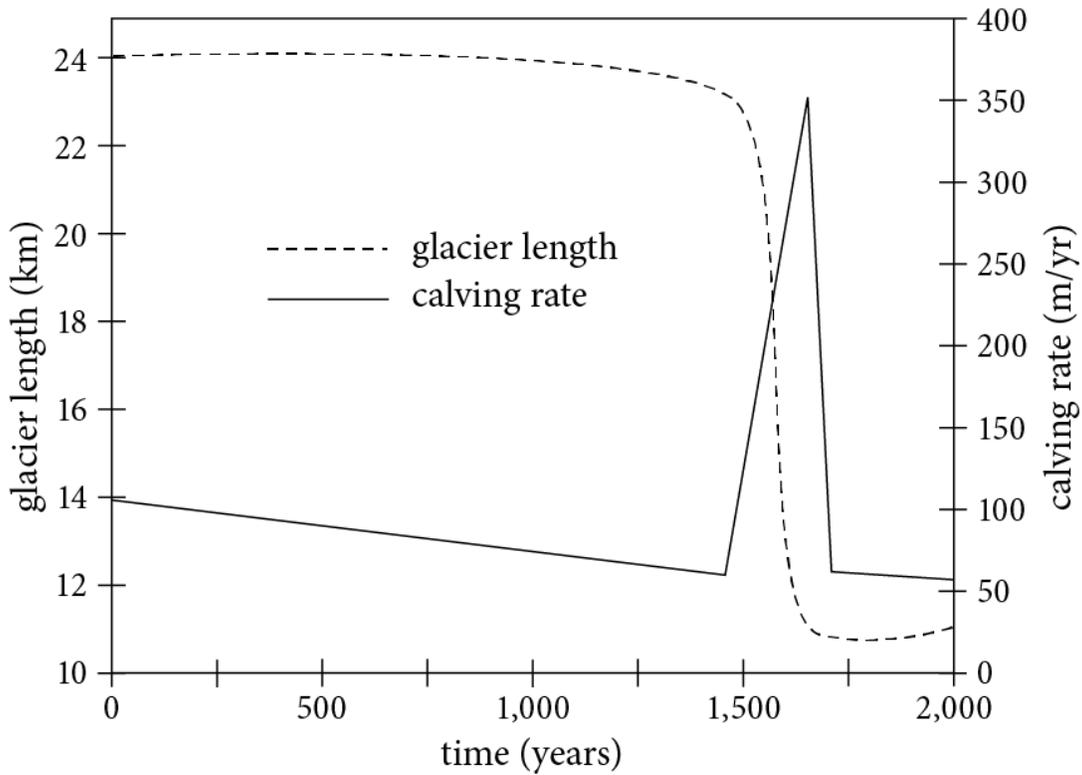


Figure 1

Study 2

Four calving glaciers (A–D) were studied over a period of 10 years. The average velocity at the terminus of each glacier was recorded for years 1–5 and again for years 6–10. The calving rate of each glacier was estimated for the same time periods. The results are recorded in Table 1.

Table 1

Table 1	Years 1-5		Years 6-10	
Glacier	Average velocity (m/yr) Years 1-5	Calving rate (m/yr)	Average velocity (m/yr) Years 6-10	Calving rate (m/yr)
A	72	72	63	64
B	51	52	45	47
C	98	106	256	312
D	160	189	53	54

Study 3

Meteorologists reported unusually high average temperatures in the regions of Glacier C and Glacier D during the same 10-year period examined in Study 2. It was hypothesized that the high temperatures were responsible for the relatively rapid variations in velocity and calving rates evident for Glacier C and Glacier D in Table 1.

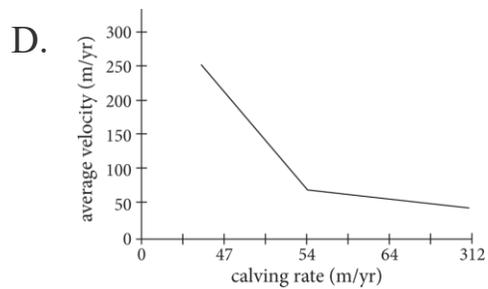
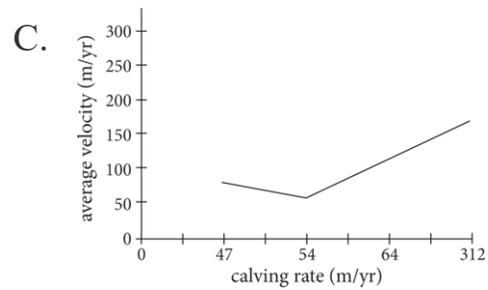
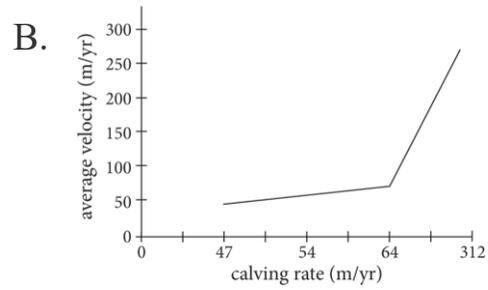
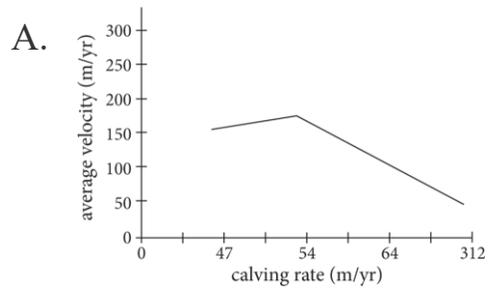
1. If the glacier model used in Study 1 is typical of all calving glaciers, the scientists would draw which of the following conclusions about the relationship between glacier length and calving rate?

- A. As calving rate decreases, glacier length always increases.
 - B. As calving rate decreases, glacier length always decreases.
 - C. A sharp increase in calving rate correlates with a sharp decrease in glacier length.
 - D. A sharp increase in calving rate correlates with a sharp increase in glacier length.
2. The meteorologists involved in Study 3 hypothesized that the faster the calving rate, the faster the sea level at a calving glacier's terminus would rise. If this hypothesis is correct, which of the following glaciers from Study 2 experienced the greatest increase in sea level at the terminus during years 6–10 ?
- F. Glacier A
 - G. Glacier B
 - H. Glacier C
 - J. Glacier D
3. Based on the results of Study 2, a calving glacier traveling at a velocity of 80 m/yr would most likely have a calving rate of:
- A. less than 72 m/yr.
 - B. between 72 m/yr and 106 m/yr.
 - C. between 106 m/yr and 189 m/yr.
 - D. greater than 189 m/yr.

4. Which of the following statements best describes the behavior of the glaciers observed during Study 2 ?

- F. All of the glaciers observed traveled faster during the first 5 years than during the last 5 years.
- G. All of the glaciers observed traveled faster during the last 5 years than during the first 5 years.
- H. The calving rate is always less than or equal to the average velocity for all of the glaciers observed.
- J. The calving rate is always greater than or equal to the average velocity for all of the glaciers observed.

5. Which of the following graphs best represents the relationship between the calving rate and the average velocity of the glaciers observed in Study 2 for years 6–10 ?



6. If the hypothesis made by the meteorologists in Study 3 is correct, the glacier modeled in Study 1 most likely experienced unusually high temperatures at approximately what time during the simulated 2,000-year study?

- F. 500 years
- G. 1,000 years
- H. 1,500 years
- J. 2,000 years

7. Based on Figure 1, what are the approximate values of glacial length and calving rate, respectively, at 1,500 years?

- A. 15 km and 125 m/yr
- B. 23 km and 125 m/yr
- C. 23 km and 350 m/yr
- D. 125 km and 350 m/yr

Passage II

Allergic rhinitis refers to an inflammatory nasal reaction to small airborne particles called *allergens*. Table 1 shows six specific allergens (three kinds of pollen and three kinds of mold) and the approximate number of reported cases of allergic symptoms each month for a population of 1,000 people living in northern Kentucky during a single year.

Table 1						
	Pollen			Mold		

✿

Note: Each ✿ equals 100 reported cases of allergic rhinitis.

Table 1						
Month	Pollen			Mold		
	Trees	Grass	Weeds	Alter-naria	Clado-sporium	Asper-gillus
January				☼	☼	☼
February				☼	☼	☼
March	☼☼			☼	☼	☼
April	☼☼☼☼			☼	☼	☼
May	☼☼☼	☼☼☼		☼	☼	☼
June		☼☼☼☼		☼	☼	☼
July		☼☼	☼	☼☼	☼	☼
August			☼☼☼	☼☼☼☼	☼☼☼	☼☼☼☼
September			☼☼	☼☼☼	☼☼☼☼	☼☼☼☼
October			☼☼	☼☼☼	☼☼	☼☼
November				☼☼	☼	☼
December				☼	☼	☼

Note: Each ☼ equals 100 reported cases of allergic rhinitis.

Weekly tree pollen and total mold spore concentrations were measured in grains per cubic meter (gr/m³) for samples of air taken in southern Iowa for 8 weeks. The tree pollen and mold spore counts are shown in Figures 1 and 2, respectively.

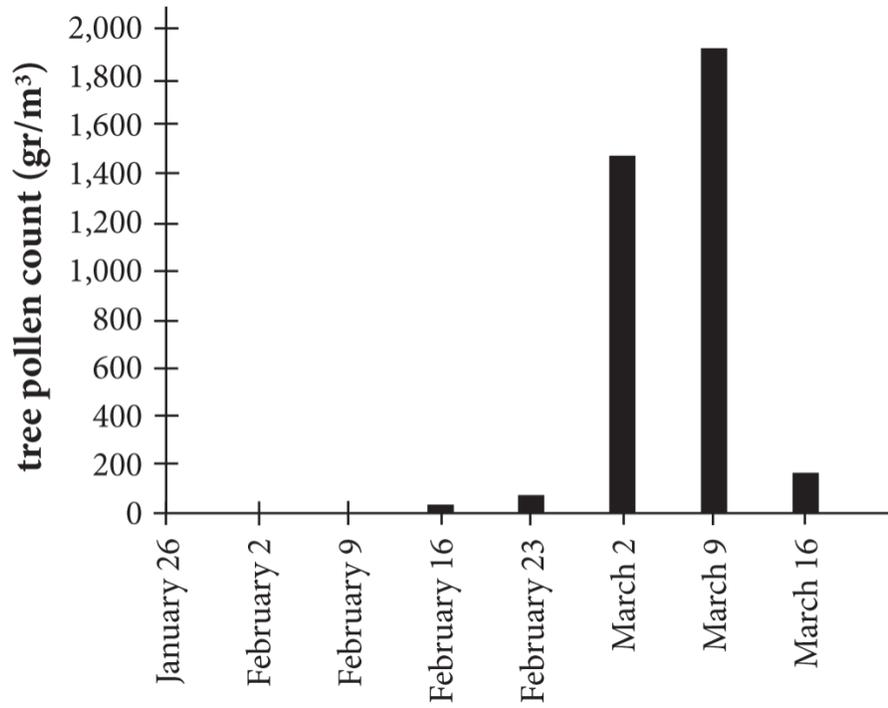


Figure 1

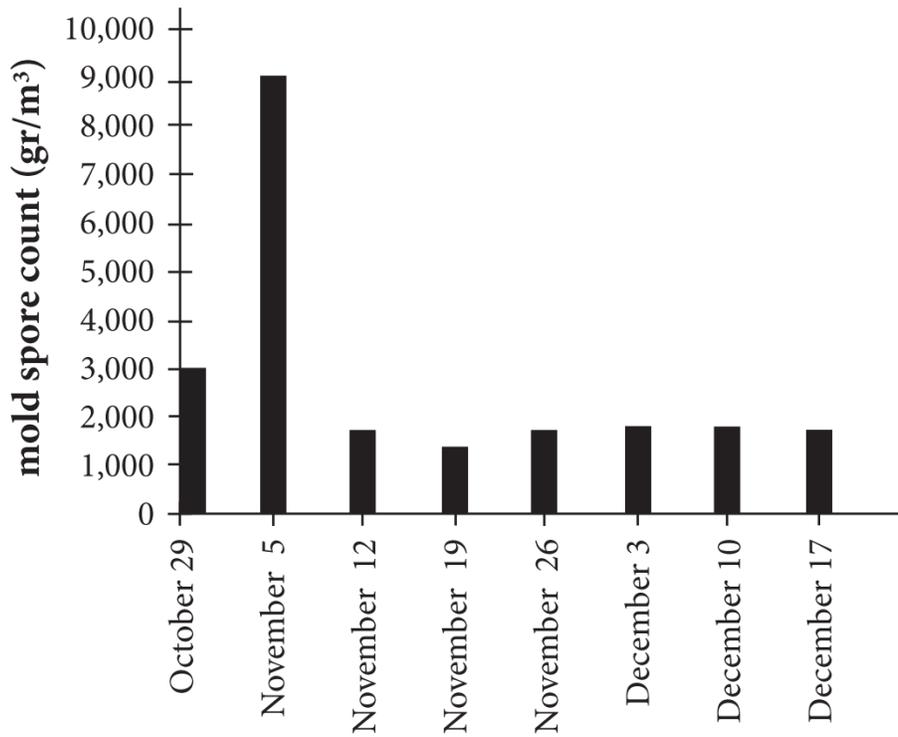


Figure 2

8. If the 1,000 patients studied were given special air filters that greatly reduce allergic rhinitis symptoms, which of the following months would have the greatest decrease in the number of allergic rhinitis cases?

- F. March
- G. June
- H. September
- J. December

9. Based on Figure 1, the tree pollen count on March 2 was closest to:

- A. 75 gr/m³.
- B. 150 gr/m³.
- C. 1,500 gr/m³.
- D. 1,900 gr/m³.

10. According to Figure 2, the mold spore count in the weeks after November 5:

- F. increased.
- G. decreased.
- H. varied between 1,000 gr/m³ and 2,000 gr/m³.
- J. remained above 2,000 gr/m³.

11. Based on the data in Figure 1, the tree pollen count increased the most between which 2 dates?
- A. February 16 and February 23
 - B. February 23 and March 2
 - C. March 2 and March 9
 - D. October 29 and November 5
12. According to Figure 1, which of the following conclusions about the tree pollen count is most valid?
- F. The tree pollen count was highest on March 9.
 - G. The tree pollen count was highest on March 16.
 - H. The tree pollen count was lowest on February 23.
 - J. The tree pollen count was lowest on March 16.
13. Based on Table 1, most of the cases of allergic rhinitis in May in northern Kentucky were caused by which of the following allergens?
- A. Tree and grass pollen
 - B. Grass and weed pollen
 - C. Alternaria spores
 - D. Aspergillus spores

Passage III

Simple harmonic motion (SHM) is a type of motion that is *periodic*, or repetitive, and can be described by its frequency of oscillation. Students performed three experiments to study SHM.

Experiment 1

The students assembled the pendulum shown in Diagram 1. The mass at the end of the arm was raised to a small height, h , and released. The frequency of oscillation was measured in oscillations per second, or hertz (Hz), and the process was repeated for several different arm lengths. The results are shown in Figure 1.

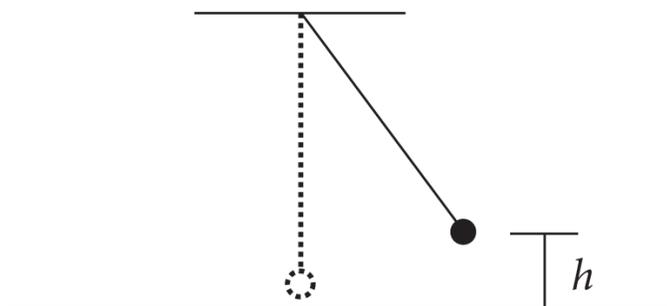


Diagram 1

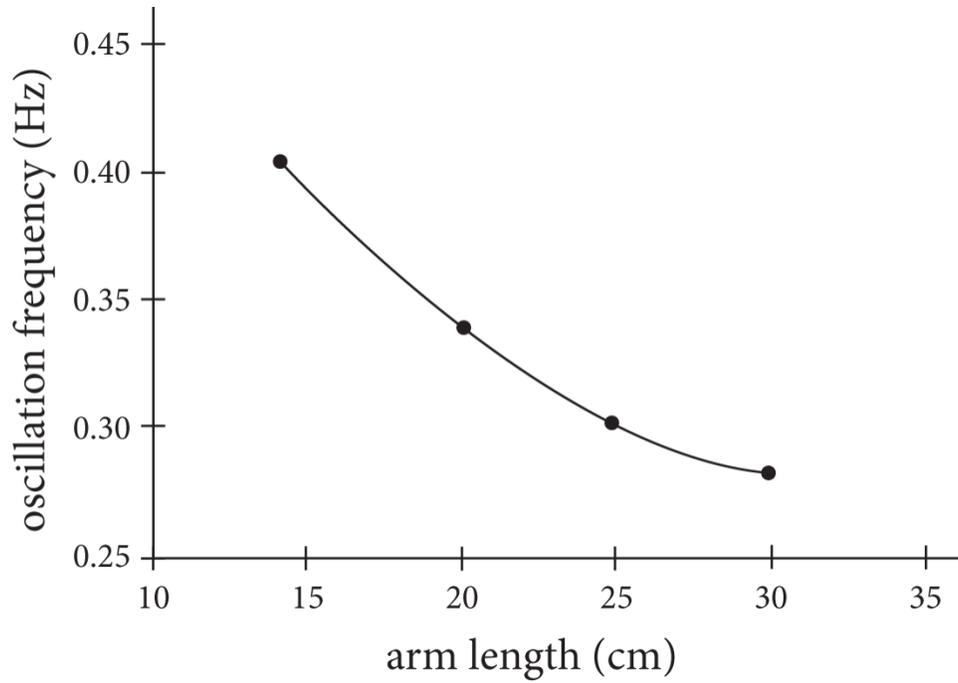


Figure 1

Experiment 2

A spring was suspended vertically from a hook, and a mass was connected to the bottom of the spring, as shown in Diagram 2. The mass was pulled downward a short distance and released, and the frequency of the resulting oscillation was measured. The procedure was repeated with 4 different springs and 4 different masses, and the results are shown in Figure 2.

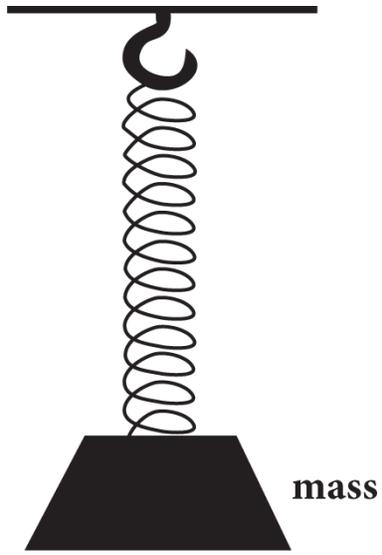


Diagram 2

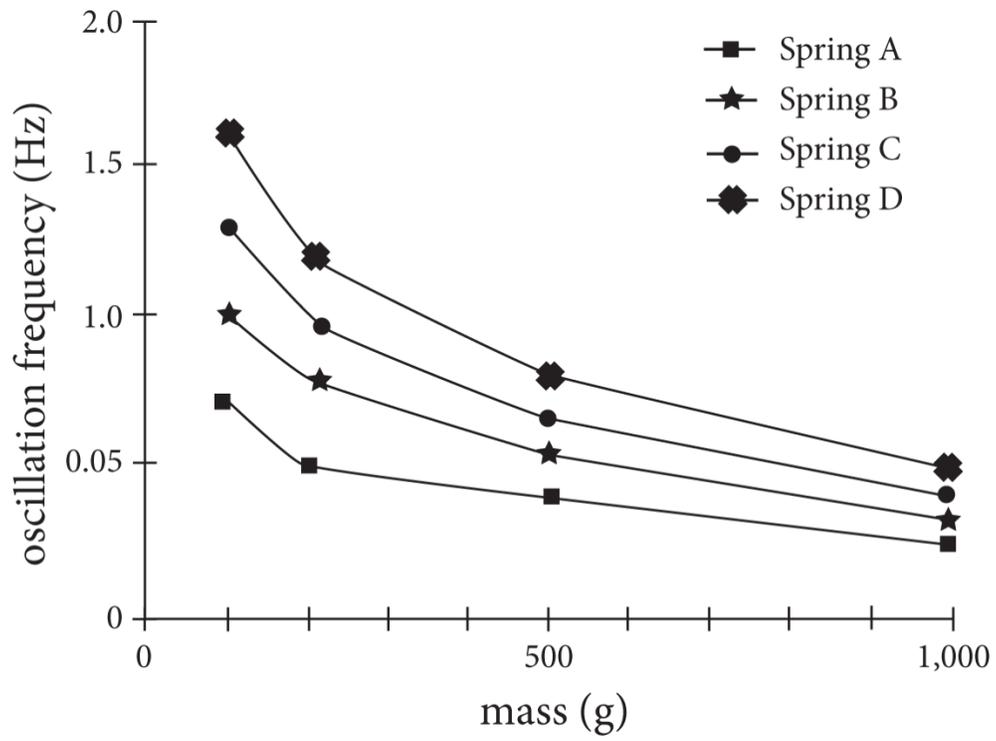


Figure 2

Experiment 3

Using the apparatus from Experiment 2, the mass-spring system was allowed to come to rest, and the *equilibrium length* of the spring was measured. The same 4 masses and 4 springs were used, and the results are shown in Figure 3.

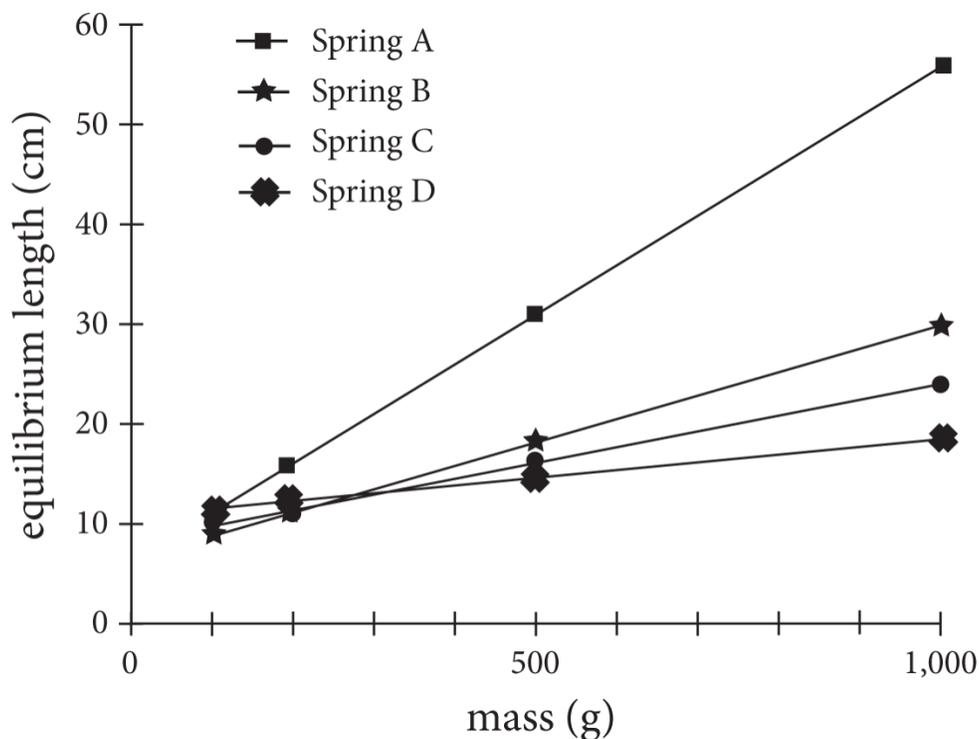


Figure 3

14. Based on the results of Experiment 3, for which of the following masses would Spring B, Spring C, and Spring D have approximately equal equilibrium lengths?

- F. 200 g
- G. 275 g
- H. 350 g
- J. 500 g

15. A student has hypothesized that as the length of the arm of a pendulum increases, the oscillation frequency of the pendulum during SHM will decrease. Do the results of Experiment 1 support her hypothesis?
- A. Yes; the oscillation frequency of the pendulum observed in Experiment 1 decreased as the arm length increased.
 - B. Yes; although the longest pendulum arm resulted in the highest oscillation frequency, the frequency decreased with increasing arm length for the other 3 lengths tested.
 - C. No; the oscillation frequency of the pendulum observed in Experiment 1 increased as the arm length increased.
 - D. No; although the longest pendulum arm resulted in the lowest oscillation frequency, the frequency increased with increasing arm length for the other 3 lengths tested.
16. Based on the results of Experiment 2, if an engineer needs the spring that oscillates most slowly after being stretched and released, which of the following springs should be chosen?
- F. Spring A
 - G. Spring B
 - H. Spring C
 - J. Spring D
17. Based on the results of Experiment 3, if a 700 g mass were suspended from Spring A, where would its equilibrium length be found once the

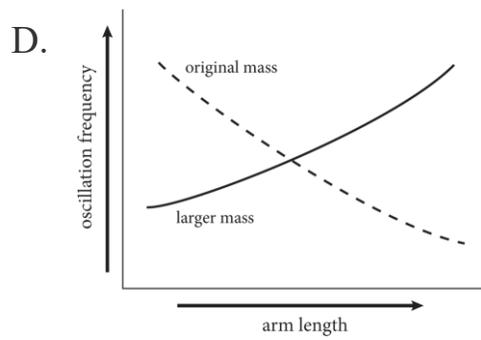
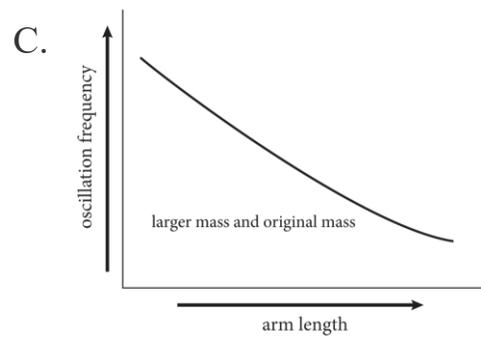
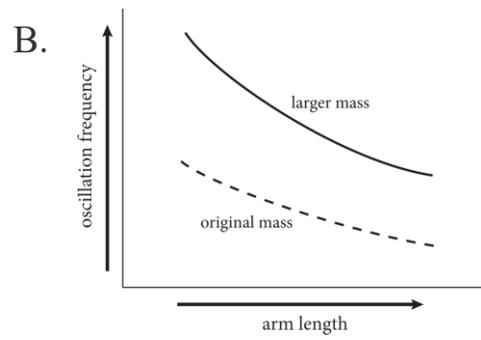
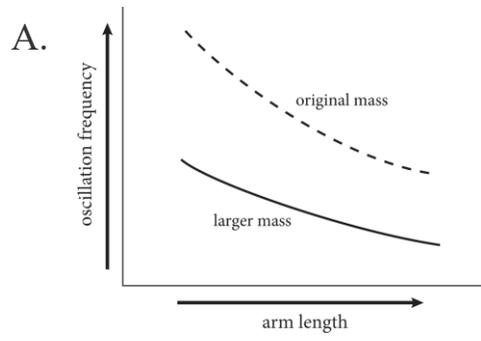
system came to rest?

- A. Less than 10 cm
- B. Between 10 cm and 30 cm
- C. Between 30 cm and 50 cm
- D. Greater than 50 cm

18. The students tested a fifth spring, Spring E, in the same manner as in Experiment 2. With a 100 g mass suspended from Spring E, the oscillation frequency was 1.4 Hz. Based on the results of Experiment 2, which of the following correctly lists the 5 springs by their oscillation frequency (with a 100 g mass suspended) from *fastest* to *slowest*?

- F. Spring E, Spring D, Spring C, Spring B, Spring A
- G. Spring D, Spring A, Spring C, Spring B, Spring E
- H. Spring A, Spring B, Spring C, Spring E, Spring D
- J. Spring D, Spring E, Spring C, Spring B, Spring A

19. Suppose Experiment 1 were repeated using a larger pendulum mass. Which of the following figures best expresses the comparison between the results that would be found using the larger pendulum mass and the results found using the original mass?



20. According to Figure 1, at which of the following arm lengths will the oscillation frequency come closest to 0.35 Hz ?

- F. 13 cm
- G. 16 cm
- H. 19 cm
- J. 21 cm

Passage IV

Human beings require a certain percentage of oxygen in the blood for proper respiratory function. The amount of oxygen in the air varies enough with altitude that people normally accustomed to breathing near sea level may experience respiratory problems at significantly higher altitudes. Table 1 shows the average percentage of oxygen saturation in the blood, as well as the average blood concentrations of three enzymes, GST, ECH, and CR, for 3 populations of high-altitude (ha) dwellers and 3 populations of sea-level (sl) dwellers. Enzyme concentrations are given in arbitrary units (a.u.). Figure 1 shows average oxygen partial pressure and average temperature at various altitudes.

Population	Altitude range (m)	Oxygen saturation (%)	Enzyme concentration (a.u.)		
			GST	ECH	CR
ha 1	3,500–4,000	98.1	121.0	89.2	48.8
ha 2	3,300–3,700	99.0	108.3	93.5	45.6

Table 1					
Population	Altitude range (m)	Oxygen saturation (%)	Enzyme concentration (a.u.)		
			GST	ECH	CR
ha 3	3,900–4,200	97.9	111.6	91.9	52.3
sl 1	0–300	98.5	86.7	57.1	44.9
sl 2	0–150	99.2	79.8	65.8	53.1
sl 3	0–200	98.7	82.5	61.4	47.0

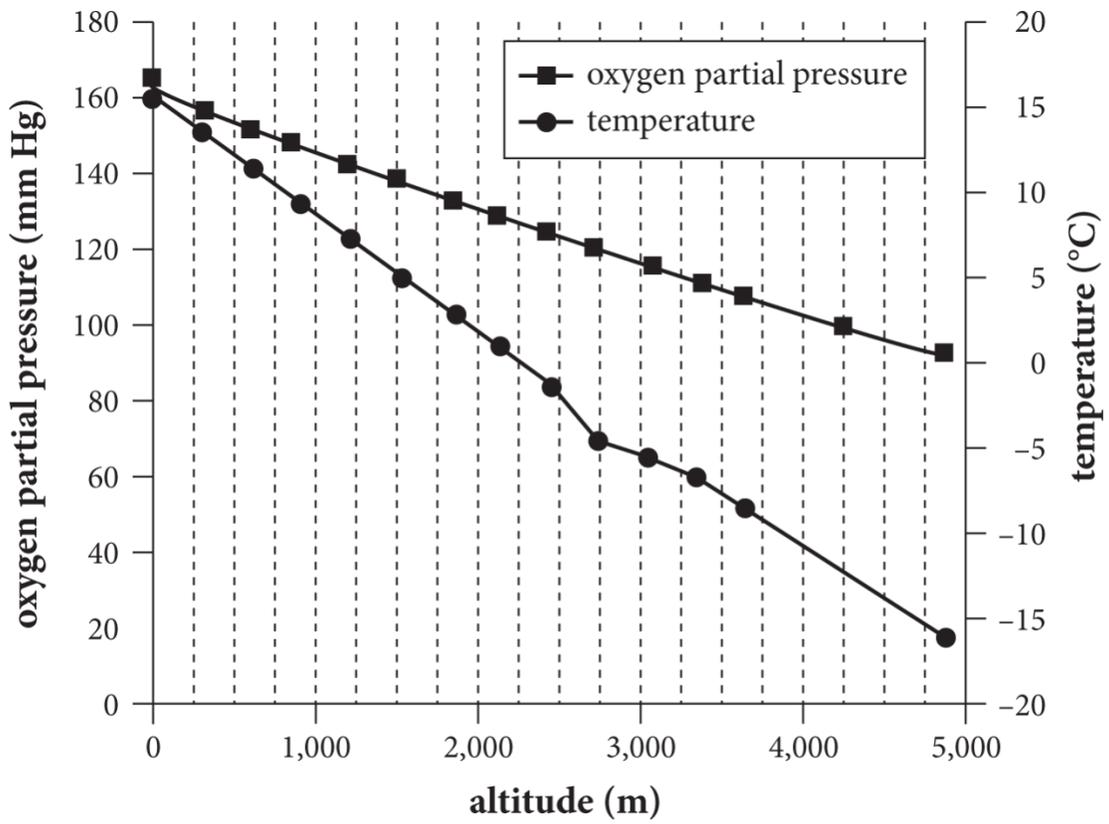


Figure 1

21. Based on the data in Table 1, it is reasonable to conclude that the blood of high-altitude dwellers contains a higher concentration of:
- A. CR than ECH.
 - B. CR than GST.
 - C. ECH than GST.
 - D. GST than CR.
22. Based on the information given, one would expect that, compared to the high-altitude dwellers, the sea-level dwellers:
- F. have blood with a lower-percentage oxygen saturation.
 - G. have blood with a lower GST concentration.
 - H. can tolerate lower oxygen partial pressures.
 - J. can tolerate lower temperatures.
23. According to Figure 1, an atmospheric sample found at an oxygen partial pressure of 110 mm Hg was most likely taken from a location with an average temperature of about:
- A. 10°C.
 - B. 5°C.
 - C. -7°C.
 - D. -13°C.

24. ECH is an enzyme that improves the efficiency of cellular energy production. Assume that people with higher ECH concentrations in the blood can function normally at higher altitudes without any respiratory difficulties. Based on Table 1, people from which population can function normally at the highest altitude?

F. sl 1

G. sl 2

H. ha 2

J. ha 3

25. Assume that a person's blood oxygen saturation percentage is determined only by the oxygen partial pressure at the location at which the person lives and the efficiency of the person's respiratory system at incorporating oxygen into the blood. Which of the following pieces of information supports the hypothesis that people from population ha 2 can incorporate oxygen into their blood more efficiently than can people from population sl 1 ?

A. Population ha 2 lives in an area where oxygen partial pressure is lower than for population sl 1, yet population ha 2 has the higher blood oxygen saturation percentage.

B. Population ha 2 lives in an area where oxygen partial pressure is higher than for population sl 1, yet population ha 2 has the lower blood oxygen saturation percentage.

C. Population ha 2 has a higher CR concentration than does population sl 1.

D. Population ha 2 has an unusually high GST concentration.

26. If a population living at 1,500–1,800 m were studied, which of the following conclusions about its average enzyme levels would most likely be true?

- F. Its levels of GST, ECH, and CR would be roughly the same as those of the high-altitude populations.
- G. Its levels of GST, ECH, and CR would be roughly the same as those of the sea-level populations.
- H. Its level of GST would be lower than that of the sea-level populations, and its levels of ECH and CR would be lower than those of the high-altitude populations.
- J. Its levels of GST and ECH would be higher than those of the sea-level populations, and its level of CR would be roughly the same as that of both high-altitude and sea-level populations.

Passage V

Two students attempt to explain why lakes freeze from the surface downward. They also discuss the phenomenon of the melting of ice under the blades of an ice skater's skates.

Student 1

Water freezes first at the surface of lakes because the freezing point of water decreases with increasing pressure. Under the surface, *hydrostatic pressure* causes the freezing point of water to be slightly lower than it is at the surface. Thus, as the air temperature drops, it reaches the freezing point of water at the surface before reaching that of the water beneath it. Only as the

temperature becomes even colder will the layer of ice at the surface become thicker.

Pressure is defined as *force* divided by the *surface area* over which the force is exerted. An ice skater exerts the entire force of his or her body weight over the tiny surface area of two very thin blades. This results in a very high pressure, which quickly melts a small amount of ice directly under the blades.

Student 2

Water freezes first at the surface of lakes because the density of ice is less than that of liquid water. Unlike with most liquids, the volume of a given mass of water expands upon freezing, and the density therefore decreases. As a result, the *buoyant force* of water acting upward is greater than the force of gravity pulling any mass of ice downward, so all ice particles float to the surface upon freezing.

Ice melts under an ice skater's skates because of friction. The energy used to overcome the force of friction is converted to heat, which melts the ice under the skates. The greater the weight of the skater, the greater the force of friction and the faster the ice melts.

27. According to Student 1, which of the following quantities is *greater* for water molecules beneath a lake's surface than for water molecules at the surface?

- A. Temperature
- B. Density
- C. Buoyant force
- D. Hydrostatic pressure

28. When two ice skaters, wearing identical skates, skated across a frozen lake at the same speed, the ice under the blades of Skater B was found to melt faster than the ice under the blades of Skater A. What conclusion would each student draw about which skater is heavier?

- F. Both Student 1 and Student 2 would conclude that Skater A is heavier.
- G. Both Student 1 and Student 2 would conclude that Skater B is heavier.
- H. Student 1 would conclude that Skater A is heavier; Student 2 would conclude that Skater B is heavier.
- J. Student 1 would conclude that Skater B is heavier; Student 2 would conclude that Skater A is heavier.

29. Which student(s), if any, would predict that ice will melt under the blades of an ice skater who is NOT moving?

- A. Student 1 only
- B. Student 2 only
- C. Both Student 1 and Student 2
- D. Neither Student 1 nor Student 2

30. A beaker of ethanol is found to freeze from the bottom upward, instead of from the surface downward. Student 2 would most likely argue that the density of frozen ethanol is:
- F. greater than the density of water.
 - G. less than the density of ice.
 - H. greater than the density of liquid ethanol.
 - J. less than the density of liquid ethanol.
31. A toy boat was placed on the surface of a small pool of water, and the boat was gradually filled with sand. After a certain amount of sand had been added, the boat began to sink. Based on Student 2's explanation, the boat began to sink because:
- A. hydrostatic pressure became greater than the buoyant force of the water on the boat.
 - B. atmospheric pressure became greater than the buoyant force of the water on the boat.
 - C. the force of gravity on the boat became greater than the buoyant force of the water on the boat.
 - D. the force of gravity on the boat became less than the buoyant force of the water on the boat.
32. According to Student 2, if friction between the ice and the blades of an ice skater's skates were somehow reduced, which of the following quantities must simultaneously decrease at the point where the blades and the ice are in contact?

- F. Pressure exerted by the blades on the ice
- G. Heat produced
- H. Force of gravity on the skater
- J. Freezing point of water

33. Based on Student 2's explanation, the reason a hot air balloon is able to rise above the ground is that the balloon and the air inside it are:

- A. less dense than the air outside the balloon.
- B. more dense than the air outside the balloon.
- C. at a higher pressure than the air outside the balloon.
- D. less buoyant than the air outside the balloon.

Passage VI

In many communities, chemicals containing fluoride ions (F^-) are added to the drinking water supply to help prevent tooth decay. Use of F^- is controversial because studies have linked F^- with bone disease. Students performed two experiments to measure F^- levels.

Experiment I

Five solutions, each containing a different amount of Na_2SiF_6 (sodium silicofluoride) in H_2O , were prepared. Five identical *electrodynamic cells* were filled with equal volumes of each of the 5 solutions, and a sixth identical cell was filled with a *blank* solution (one containing no added Na_2SiF_6). The cells were activated to measure the electrical *conductivity* for

each. The conductivities were then corrected by subtracting the conductivity of the blank solution from each value (see Table 1 and Figure 1).

Table 1		
Concentration of F ⁻ (mg/L)	Measured conductivity (μ S/cm)	Corrected conductivity (μ S/cm)
0.0	15.96	0.00
0.1	16.13	0.17
0.5	16.80	0.84
1.0	17.63	1.67
2.0	19.30	3.34
4.0	22.64	6.68
mg/L is milligrams per liter. μ S/cm is microsiemens per centimeter.		

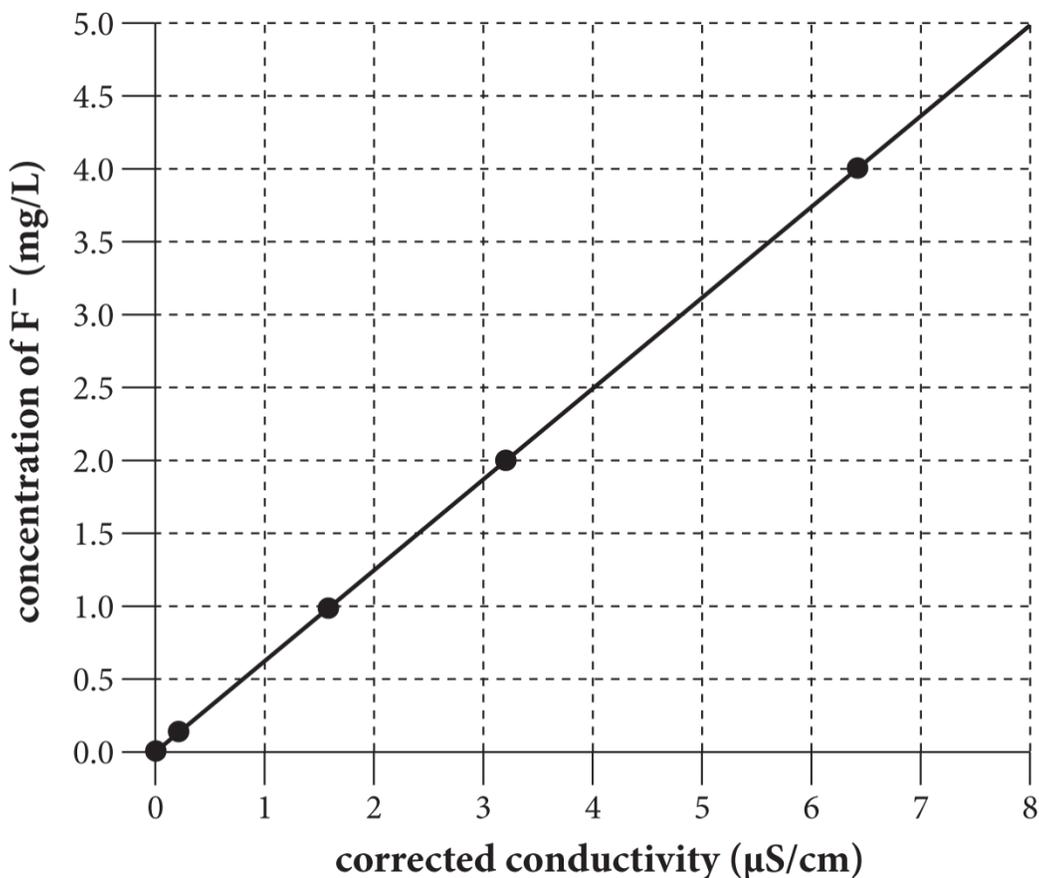


Figure 1

Experiment 2

A water sample was taken directly from the drinking water supply of one community. An electrodynamic cell identical to those used in Experiment 1 was filled with water from this sample, and the cell was activated. The procedure was repeated for water samples from several other communities, and the conductivities were measured. The students then used these measured conductivities and the results from Experiment 1 to calculate fluoride ion concentrations (see Table 2).

Table 2		
Community	Measured conductivity ($\mu\text{S/cm}$)	Concentration of F^- (mg/L)

Table 2		
Community	Measured conductivity ($\mu\text{S}/\text{cm}$)	Concentration of F^- (mg/L)
Newtown	22.31	3.8
Springfield	16.46	0.3
Lakewood	18.63	1.6
Reading	19.47	2.1

34. Students subtracted the measured conductivity of the blank solution from the sample solutions in Experiment 1 in order to:

- F. determine the amount of conductivity solely due to F^- ions.
- G. calibrate the electrodynamic cells.
- H. correct for non-ionic impurities.
- J. test the solubility of F^- .

35. Based on the results of Experiment 1, if the concentration of F^- in a solution is doubled, then the corrected conductivity of the solution will approximately:

- A. remain the same.
- B. halve.
- C. double.
- D. quadruple.

36. After Experiment 2, a sample was also taken from the drinking water supply of the community of Bluewater and its conductivity was measured to be $20.69 \mu\text{S}/\text{cm}$. Which of the following correctly lists the drinking water supplies of Newtown, Lakewood, and Bluewater in increasing order of F^- concentration?

- F. Lakewood, Newtown, Bluewater
- G. Bluewater, Newtown, Lakewood
- H. Newtown, Bluewater, Lakewood
- J. Lakewood, Bluewater, Newtown

37. Based on the results of Experiment 1, if a solution with a fluoride ion concentration of $3.0 \text{ mg}/\text{L}$ had been tested, the corrected conductivity would have been closest to which of the following values?

- A. $2.0 \mu\text{S}/\text{cm}$
- B. $3.5 \mu\text{S}/\text{cm}$
- C. $5.0 \mu\text{S}/\text{cm}$
- D. $6.5 \mu\text{S}/\text{cm}$

38. If Experiment 1 were repeated to measure the conductivity of chloride ions (Cl^-) in drinking water instead, then which of the following changes in procedure would be necessary?

- F. The solutions should be prepared by adding different concentrations of NaCl (or another chemical containing Cl^-) to H_2O .
- G. The conductivity of the blank solution should be added to the measured conductivities to find the corrected conductivities.
- H. The electrodynamic cells should be set to measure resistivity instead of conductivity.
- J. The solutions should be prepared by adding different concentrations of NaCl (or another chemical containing Cl^-) and Na_2SiF_6 to H_2O .

39. Based on the results of Experiments 1 and 2, if the measured conductivities for the samples tested in Experiment 2 were compared with their corrected conductivities, the measured conductivities would be:

- A. lower for all of the samples tested.
- B. higher for all of the samples tested.
- C. lower for some of the samples tested and higher for others.
- D. the same for all of the samples tested.

40. The presence of other negative ions, such as Cl^- , results in an increase in the electrical conductivity of a solution. If all of the samples tested in Experiment 2 contained small concentrations of Cl^- , how would the results have been affected? Compared to the actual F^- concentrations, the calculated F^- concentrations would be:

- F. higher.
- G. lower.
- H. the same.
- J. higher for some of the samples, but lower for others.

Writing Test

40 Minutes — 1 Question

Directions: The essay is used to evaluate your writing skills. You will have **40 minutes** to review the prompt and plan and write an essay in English. Before you begin, read everything in this test booklet carefully to make sure you understand the task.

Your essay will be judged based on the evidence it provides of your ability to do the following:

- Assert your own perspective on a complex issue and evaluate the relationship between your perspective and at least one other perspective
- Use reasoning and evidence to refine and justify your ideas
- Present your ideas in an organized way
- Convey your ideas effectively using standard written English

Write your essay on the lined essay pages in the answer booklet. All writing on those lined pages will be scored. Use the unlined pages in this test booklet to plan your essay. Your work on these unlined pages will not be scored.

Put your pencil down as soon as time is called.

DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO.

Experiential Education

Experiential education is a philosophy that holds that students learn best through direct experience. Hands-on learning is said to promote deeper understanding because students are able to apply concepts and theories to physical situations. Rather than being required to memorize facts, students are given the opportunity to create physical evidence of logical reasoning and are thus better equipped to apply the same reasoning to new situations. Since all teachers aim to impart critical thinking in their classrooms, should they be expected to provide more hands-on learning opportunities? As educators aim to continuously improve the quality of the education they offer to students, consideration should be given to better incorporating hands-on learning.

Read and carefully consider these perspectives. Each suggests a particular approach regarding experiential education.

Perspective One

Some argue
that to
accept a

Perspective Two

Experiential
education is
an integral

Perspective Three

Schools
cannot be
expected to

theory without experiencing it is to learn nothing at all. Teachers need to provide opportunities for experiential involvement if they expect students to truly comprehend each lesson plan objective.

part of readying students to pursue careers in the science, technology, engineering, and math fields, but not all disciplines. If students are expected to perform skill-based tasks in these fields after they graduate, they should be provided a strong foundation on which to build their careers. However,

offer hands-on learning for students. Not only is it costly, but also it may not be effective for all learners. Students will be better served if schools invest money in other educational models and opportunities.

teachers
should not
be expected
to supply
experiential
learning
where it is
not
appropriate.

Essay Task

Write a clear, well-reasoned essay evaluating multiple perspectives on experiential education. In your essay, be sure to:

- Assert your own perspective on the issue and evaluate the relationship between your perspective and at least one other perspective
- Use reasoning and evidence to refine and justify your ideas
- Present your ideas in an organized way
- Convey your ideas effectively using standard written English

Your perspective may be fully, somewhat, or not at all in agreement with one or more of the three perspectives in the prompt.

Planning Your Essay

These pages are not scored.

Use the space below the prompt or another piece of paper to brainstorm and plan your essay. Consider the following as you think about the prompt:

- Strengths and weaknesses of the three perspectives in the prompt
 - What observations do they offer, and what do they overlook?
 - Why are they persuasive or why are they not persuasive?
- Your own background and identity
 - What is your perspective on this issue, and what are its strengths and weaknesses?
 - What evidence will you use in your essay?

Answers and Explanations

ENGLISH TEST

1. *Passage I*

1. **C**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choice (C) forms a complete sentence by using the simple past tense *was*. Choice A creates a sentence fragment; an *-ing* verb needs a helping verb, such as *was* or *is*, to be the main verb in a sentence. Choice B incorrectly uses a comma to separate the subject from the main verb. Choice D omits the verb entirely, creating a sentence fragment.

2. **H**

Difficulty: Medium

Category: Organization

Getting to the Answer: The phrase *not only* in the beginning of the sentence is your clue to the correct answer. Logically, the phrase *not only* is always followed by *but also*. The other choices neither complete the idiom correctly nor convey the necessary contrast between the ideas in the two clauses.

3. C

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Add an apostrophe and an s to a singular noun to show possession. The narrator and Gretchen attend one school, so (C) is correct. Choice A omits the apostrophe needed to show that the *swim team* belongs to the *school*. Choice B incorrectly treats *school* as a plural, placing the apostrophe after the s. Choice D incorrectly uses *ours* and does not make *school* possessive.

4. J

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choice F is incorrect because, as written, the sentence contains a sentence structure error: It is not clear who knows that the writer enjoyed swimming. Choice (J) corrects the error and uses the active voice. Choices G and H use the passive voice and are wordy.

5. **B**

Difficulty: Low

Category: Development

Getting to the Answer: Choice (B) indicates that the narrator's mother recommended swimming lessons but did not decide that the narrator *must* take them. Choices A, C, and D all indicate that the mother's mind was made up.

6. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: If a sentence seems to have too many ideas, then it is probably a run-on. By itself, a comma cannot separate two clauses that could be independent sentences, as in F. Choice G replaces *swimmers* with a pronoun but does not correct the run-on. Similarly, H removes the comma but does not address the problem of two complete thoughts that are incorrectly joined. Choice (J) solves the problem by using *whom*, which turns the second half of the sentence into a dependent clause that describes the *women*.

7. **B**

Difficulty: High

Category: Sentence Structure

Getting to the Answer: This sentence contains a parenthetical phrase. If you omitted “who had been swimming competitively since elementary school,” you would still have a complete sentence. Like all parenthetical phrases, this needs to be set off from the rest of the sentence. A comma is used at the beginning of the phrase, so a comma must also be used at the end of the phrase. This makes D incorrect. Choices A and C insert unnecessary commas within the parenthetical phrase.

8. **F**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choice (F) is correct because *and* correctly connects the independent clause “I came back the next day” with the phrase “the next for practice” to create a compound sentence. Choices G and J include unnecessary punctuation, and H creates a fragment on the right side of the semicolon.

9. **D**

Difficulty: Medium

Category: Agreement

Getting to the Answer: Trust your ear. *Begin* is an irregular verb; the simple past tense *began* can be used by itself, but the past participle *begun* cannot. Instead, *begun* always appears with *has*, *have*, or *had*,

as in “I *have begun* to prepare for the ACT.” Choice (D) correctly uses the simple past tense *began*. Choice B creates another verb usage error by inserting *been*. Choice C incorrectly uses *began* with *had*.

10. **H**

Difficulty: Medium

Category: Agreement

Getting to the Answer: Don’t panic if you see a question that tests the use of *who* and *whom*. The pronoun *who* serves as a subject, just like the pronouns *he* and *she* replace subjects. The pronoun *whom* serves as an object, just like the pronouns *him* and *her* replace objects. Here, *coach* is the subject of the sentence, so *who*, (H), is correct. Never refer to a person as *which*, as in J.

11. **A**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: Don’t force a change where one isn’t needed. The correct answer for some of the underlined portions will be NO CHANGE. The sentence “The hard work eventually paid off,” is correct and concise as it is written. Choice B is verbose, and C and D create run-on sentences.

12. **G**

Difficulty: Medium

Category: Development

Getting to the Answer: Start by asking yourself, “Does this information belong here?” The question asks for a sentence that is relevant to the narrator’s experience on the swim team. Only (G) is connected to the narrator and the swim team; the sentence explains that the narrator was one of the only swimmers on the team to be interested in the butterfly. The history of the stroke, F; the relative speed of the stroke, H; and an alternative name for the stroke, J, are not as related to the narrator’s personal experience.

13. **A**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: The shortest answer is often, but not always, correct. Don’t omit portions that add relevant information to the sentence. The sentence is about the narrator’s swimming, so her participation in the medley relay is relevant. Choices B and C add descriptions of the medley relay that are not relevant to the topic.

14. **H**

Difficulty: Medium

Category: Agreement

Getting to the Answer: The four choices offer different tenses of the same verb. The clue *last year* indicates that the narrator earned the varsity letter in the past. Choice (H), the simple past tense, is correct. Neither the future perfect tense, F, nor the present tense, J, makes sense with the clue *last year*. Choice G would only make sense if something had prevented the narrator from earning the varsity letter.

15. **B**

Difficulty: Medium

Category: Development

Getting to the Answer: Keep the main point of the passage in mind. Before beginning high school, the narrator had never thought of herself as an athlete. Then she joined the swim team and became successful at the sport. Choice (B) is most relevant to the central ideas of the passage. Choices A and C focus too narrowly on details in the passage, while D contradicts the main point of the passage.

7. *Passage II*

16. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Don't assume that a comma or semicolon is needed just because a sentence is long. Read the sentence aloud to

yourself and you should be able to hear that a comma is not needed in the underlined portion. A semicolon, as in F, would only be correct if the second half of the sentence expressed a complete thought. Choices G and H both use an unnecessary comma.

17. **A**

Difficulty: Low

Category: Agreement

Getting to the Answer: When a verb is underlined, check to see whether it agrees with its subject. Watch out for descriptive phrases that separate a verb from its subject. Here, the verb *was* agrees with the singular noun *tank*, so (A) is correct. Choice B uses the present tense, but the surrounding sentences use the past tense. Choices C and D incorrectly use a verb in the plural form.

18. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: When the word *that* or *which* is underlined, watch out for an incomplete sentence. As it is written, this is a sentence fragment; a complete verb is missing. Removing *that*, as in (J), turns *made* into the main verb of a complete and correct sentence. Choice G does not address the sentence fragment error, and H also fails to provide a clear and appropriate sentence.

19. **D**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: If you are *familiar* with a type of animal, then you have almost certainly *seen it before*. Choice (D) creates a concise sentence that does not lose any of the original meaning. The other choices are redundant. Choice B repeats *sights* when *view* has already been used, and C uses the unnecessarily repetitive phrase “to which I was no stranger.”

20. **H**

Difficulty: High

Category: Organization

Getting to the Answer: Scan the paragraph for connecting words and phrases that you can use as clues to determine the most logical order of sentences. In Sentence 5, the word *first* suggests that the sentence should be placed close to the beginning of the paragraph. Sentence 2 says, “There were *also* animals I had never before glimpsed,” which indicates that a preceding sentence discusses animals the writer had glimpsed. Sentence 5, which describes the writer’s view of familiar animals, most logically belongs immediately after Sentence 1.

21. **C**

Difficulty: Low

Category: Agreement

Getting to the Answer: If an underlined verb agrees with its noun, then determine whether the verb’s tense makes sense in the context of the passage. The surrounding verbs are in the past tense, so this sentence should use the simple past tense *saw*, which is (C). Choices A and D use the present tense, and B illogically uses the past progressive “had been seeing.”

22. **G**

Difficulty: High

Category: Organization

Getting to the Answer: An effective first sentence for a paragraph will introduce the topic of the paragraph and connect that topic to ideas that have come before. Paragraph 3 focuses on the catfish, while Paragraph 4 describes the large alligator and snapping turtle in the bayou tank. Choice (G) would provide an effective connection between these paragraphs, referring to the catfish and introducing the idea that there were even bigger animals on display. Neither F nor H leads into the topic of Paragraph 4. Choice J doesn’t provide a transition from the discussion of the catfish in Paragraph 3.

23. **C**

Difficulty: Medium

Category: >Development

Getting to the Answer: The phrase in question provides a visual image; deleting the phrase would mean losing a description, (C). The removal of the phrase would not affect the transition between sentences, A. Contrary to B, the contrast between images would be decreased. The level of suspense may be somewhat decreased by the loss of the description, but it would not be increased, as stated in D.

24. J

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: The word *though* is nonessential and must be set off from the rest of the sentence with proper punctuation. Choice (J) correctly places *though* in between two commas. Choices F and G do not include two commas, and H adds an unnecessary comma after the word *it*.

25. C

Difficulty: Medium

Category: Agreement

Getting to the Answer: If something sounds awkward or unusual, there is probably an error. Most words that end in *-ly* are adverbs; they are used to modify verbs, adjectives, or other adverbs. Adverbs cannot be used to describe nouns, such as *moment*, as in A. Choice (C)

correctly uses the adjective *slight* to modify *panic*. The sentences formed by B and D don't make sense.

26. **J**

Difficulty: Low

Category: Agreement

Getting to the Answer: The phrase “much of the onlookers” probably sounds strange to you. That’s because *much* is used with noncountable things or concepts (as in “there isn’t much time”) or quantities (as in “there isn’t much pizza left”). You could count the number of *onlookers*, so *many*, (J), is correct. Choices G and H also create idiomatic errors.

27. **B**

Difficulty: Medium

Category: Development

Getting to the Answer: The question tells you that the writer’s goal is to describe the appearance of the crayfish, so eliminate the sentence that does not have details about how crayfish look, C. Choice A suggests that crayfish look like lobsters, and D describes the crayfish as small. Neither of these sentences offers the descriptive detail that is given in (B).

28. **G**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Trust your ear. You naturally pause when a comma or semicolon is needed in a sentence. A pause between *all* and *I* just doesn't sound right; that's because the full introductory phrase "After seeing all I could inside the museum" should not be interrupted. A comma should not separate a verb (*seeing*) from its object (*museum*). This eliminates F and H. A comma is needed between an introductory phrase and the complete thought that follows, making (G) correct and J incorrect.

29. **D**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: Say it simply. The shortest answer here, (D), is correct: it turns the passive construction "it was that" in A and B into the active "I had." Choice C is unnecessarily wordy.

30. **J**

Difficulty: High

Category: Sentence Structure

Getting to the Answer: A sentence must have a subject and verb and must express a complete thought. The sentence that begins “And operates” does not have a subject. Removing the period, (J), creates a grammatically correct sentence. Choice G is awkwardly worded. Choice H creates a run-on sentence; a coordinating conjunction such as *and* needs to be used along with a comma to link two complete thoughts.

Passage III

31. **C**

Difficulty: Medium

Category: Agreement

Getting to the Answer: The pronoun *it* does not agree with its antecedent, “secret identities and elaborate disguises,” so A and B are incorrect. Choice (C) corrects the error by using the plural pronoun *they* to refer to the plural antecedent. Choice D fixes the original error but creates a sentence fragment, so it is incorrect.

32. **H**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Many English questions will focus on the correct use of commas. Commas should be used to separate an

appositive or descriptive phrase from the main part of the sentence. The phrase “the restaurant critic for the *New York Times*” describes the noun *Ruth Reichl*, so the phrase should be set off with commas, as in (H). Choices F and J fail to use both necessary commas. On the other hand, G incorrectly inserts a third comma.

33. **D**

Difficulty: High

Category: Development

Getting to the Answer: Only add sentences that are directly connected to the topic of a paragraph. Paragraph 2 discusses the importance of a *Times* review to restaurants in New York City. The suggested sentence provides a specific detail about one restaurant without explaining how the review from the *Times* affected business. Choice (D) best explains why the sentence should not be added.

34. **F**

Difficulty: Medium

Category: Agreement

Getting to the Answer: Trust your ear. You look *to* someone or something for advice. No change is needed. Choice G suggests that the paper is looking along *with* its readers, while H suggests that the readers are looking near the newspaper. Choice J uses an *-ing* verb without a helping verb, creating a sentence fragment.

35. **B**

Difficulty: Low

Category: Sentence Structure

Getting to the Answer: Verbs must make sense in the context of the passage. The next sentence says that a negative review “can undermine” a restaurant. Because the two sentences discuss possible results of a review, the underlined verb in this sentence should be in the same tense—*can bring*, (B). Choice A illogically uses the past tense. Choices C and D express certainty in the outcome, which does not match the use of *can* in the following sentence.

36. **F**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: The subject of the sentence is “restaurant owners and workers,” and the verb is *have*. There isn’t a descriptive phrase or clause separating the subject and verb, so no comma is needed. A semicolon should be used to connect two complete thoughts, so G is incorrect. Because *restaurant* identifies the type of owners and workers, the comma in H incorrectly separates an adjective from the nouns it describes. A comma should be used with *and* only when separating independent clauses or lists of three or more items, so the comma in J is unnecessary.

37. **C**

Difficulty: Medium

Category: Agreement

Getting to the Answer: To whom does the meal belong? It belongs to the *writer*, so the possessive pronoun *whose* is correct. *Who's*, B, is always a contraction for *who is* or *who has*. Choices A and D introduce sentence structure errors.

38. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: The sentence is a fragment, so F is incorrect. Choice (J) correctly adds the helping verb *was*, fixes the fragment, and does not introduce new issues. Choice G adds the helping verb but includes an unnecessary comma, and H does not fix the fragment.

39. **C**

Difficulty: Low

Category: Conciseness

Getting to the Answer: On the ACT, there's no need to say the same thing twice. *Common*, *ordinary*, *representative*, and *average* all have very similar meanings; so A and B use redundant language. Choice (C)

makes the sentence concise by using only *typical*. Choice D uses a word that does not make sense in the context of the sentence.

40. **H**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: If you have *decided* to do something to solve a problem, you have found a *solution*—there’s no need to use both words. Choice (H) eliminates the redundancy and verbosity errors of the other choices.

41. **B**

Difficulty: High

Category: Agreement

Getting to the Answer: As a rule, modifying words, phrases, and clauses should be as close as possible to the things or actions they describe. For instance, the list beginning “such as an attractive blonde named Chloe” describes the different personas. Therefore, *different personas* should come right before the list. This eliminates A. Choice (B) correctly uses an introductory phrase and makes *Reichl* the subject of the sentence. Choice C is a sentence fragment; a complete verb is missing. Choice D inserts an unnecessary comma between *clothing* and *that*, and the pronoun *herself* is incorrect in context.

42. **G**

Difficulty: Medium

Category: Development

Getting to the Answer: The most logical and effective sentence will be connected to the main topic of the paragraph and make a transition to the following sentence. Paragraph 4 describes how Reichl turned herself into different characters, and Paragraph 5 describes the results of reviewing a restaurant while in disguise. The best link between these ideas is (G). Choice F is a narrow detail that does not connect the two paragraphs, while H and J move completely away from the topic of Reichl’s disguises.

43. **D**

Difficulty: High

Category: Organization

Getting to the Answer: Sometimes it helps to rephrase a question in your own words. For example, this question could be rewritten as “What does the phrase *of a restaurant* describe?” Reichl focuses on the quality of a restaurant, so the best placement is (D). The phrase does not describe *developed, view, or person*.

44. **G**

Difficulty: High

Category: Development

Getting to the Answer: The word *occasionally* means “sometimes,” so its placement in this sentence indicates that Reichl was sometimes treated very differently when she was in disguise and that sometimes she wasn’t. Removing the word *occasionally* would indicate that Reichl always or typically had a different experience as one of her personas, as in (G).

45. **A**

Difficulty: Medium

Category: Organization

Getting to the Answer: Paragraph 6 describes the effect of Reichl’s use of disguises when she reviewed restaurants. Logically, this information should follow the explanation of why and how Ruth dined as different people, the topics of Paragraphs 3 and 4. Paragraph 6 should remain where it is.

8. *Passage IV*

46. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Trust your ear. A comma indicates a short pause, which you won't hear when you read this part of the sentence aloud. No comma is needed, making (J) the correct answer. A comma can be used to separate a descriptive phrase from the rest of the sentence, as in F and H, but neither “would develop into prizewinning vegetables” nor “develop into prizewinning vegetables” is a descriptive phrase. Choice G incorrectly treats the underlined portion of the sentence as part of a list.

47. **D**

Difficulty: High

Category: Organization

Getting to the Answer: The paragraph describes events in chronological order, from the last freeze of the year to the time that spring “truly arrived.” Sentence 3 describes thinning out the plants and pulling weeds so the new plants would grow; it would only make sense to do this *a* *er* the seeds have been planted and have started to grow. Sentence 4 is about planting seeds, so Sentence 3 must come *a* *er* Sentence 4, making (D) the correct answer.

48. **H**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: When you read this sentence aloud, you should be able to hear a short pause between *burden* and *less*. This pause indicates that the conjunction *and* is needed to separate the two descriptions, as in (H). Choice G is incorrect because a colon is used to introduce a brief definition, explanation, or list. Choice J uses the inappropriate conjunction *but*, which doesn't make sense in context.

49. **D**

Difficulty: Medium

Category: Development

Getting to the Answer: When “DELETE the underlined portion” is an option, consider whether the underlined portion is relevant to the topic of the sentence or paragraph. Paragraph 2 is about the writer's failure to maintain her garden, not about the weather in July and August. Choice (D) is correct.

50. **G**

Difficulty: Low

Category: Organization

Getting to the Answer: This question asks for the choice that would NOT work in the sentence. In other words, three of the answer choices would make sense in the sentence. The first sentence of Paragraph 3 contrasts with Paragraph 2, so the contrasting transitions in F, H, and J

are all possible substitutions for the underlined word. *Indeed*, (G), is a word used to show emphasis, not contrast.

MATHEMATICS TEST

- 1. B.** Substitute $x = 9$ into the expression $8x - 15$. Calculate $8(9) - 15 = 72 - 15 = 57$.
- 2. H.** Solve the equation $9y + 14 = 59$ by first subtracting 14 from both sides to get $9y = 45$. Then divide both sides by 9 to get $y = 5$.
- 3. D.** To find 22% of 450, convert the percentage to a decimal (0.22) and multiply: $0.22 \times 450 = 99$.
- 4. F.** Distribute 6 through the parentheses: $6(3x + 8) = 6 \cdot 3x + 6 \cdot 8 = 18x + 48$.
- 5. A.** If the jacket costs \$84 after a 30% discount, then \$84 represents 70% of the original price (since $100\% - 30\% = 70\%$). Set up the equation $0.70 \times \text{original} = 84$, so $\text{original} = 84 \div 0.70 = 120$.
- 6. J.** Use the slope formula $m = (y_2 - y_1)/(x_2 - x_1)$ with points (5, 12) and (11, 36). Substituting gives $m = (36 - 12)/(11 - 5) = 24/6 = 4$.
- 7. C.** Substitute $x = 4$ into the function $k(x) = 2x^2 - 6x + 5$. Calculate $k(4) = 2(4)^2 - 6(4) + 5 = 2(16) - 24 + 5 = 32 - 24 + 5 = 13$.
- 8. G.** First evaluate the expression inside the absolute value: $-23 + 9 = -14$. The absolute value of -14 is 14.
- 9. B.** The area of a triangle is $A = (1/2) \times \text{base} \times \text{height}$. Calculate $A = (1/2) \times 26 \times 15 = 195 \text{ cm}^2$.
- 10. H.** Solve $8x - 13 = 3x + 32$ by first subtracting $3x$ from both sides to get $5x - 13 = 32$. Add 13 to both sides to get $5x = 45$. Divide by 5 to get $x = 9$.
- 11. D.** The area of a circle is $A = \pi r^2$. Substituting $r = 12$ and $\pi \approx 3.14$ gives $A = 3.14 \times (12)^2 = 3.14 \times 144 = 452.16 \text{ cm}^2$.
- 12. F.** Factor the quadratic $x^2 - 11x + 30$. Looking for two numbers that multiply to 30 and add to -11, we get -5 and -6. So $(x - 5)(x - 6) = 0$, meaning both $(x - 5)$ and $(x - 6)$ are factors.
- 13. A.** To find the percentage, divide the number who play basketball by the total: $85/200 = 0.425 = 42.5\%$.
- 14. J.** The two points (-5, 7) and (7, 7) have the same y-coordinate, so they lie on a horizontal line. The distance between them is the absolute value of the difference in x-coordinates: $|7 - (-5)| = |12| = 12$.
- 15. C.** If $5/12$ of a number equals 35, set up the equation $(5/12)n = 35$. Multiply both sides by $12/5$ to get $n = 35 \times (12/5) = 420/5 = 84$.

- 16. G.** Calculate 3^5 by multiplying 3 by itself five times: $3 \times 3 \times 3 \times 3 \times 3 = 243$.
- 17. B.** Let the five consecutive even integers be $n, n+2, n+4, n+6,$ and $n+8$. Their sum is $n + (n+2) + (n+4) + (n+6) + (n+8) = 130$. Simplifying: $5n + 20 = 130$, so $5n = 110$, and $n = 22$. The middle integer is $n+4 = 26$.
- 18. H.** Use FOIL to expand $(x - 12)(x + 4)$. First: $x \cdot x = x^2$. Outer: $x \cdot 4 = 4x$. Inner: $-12 \cdot x = -12x$. Last: $-12 \cdot 4 = -48$. Combining gives $x^2 + 4x - 12x - 48 = x^2 - 8x - 48$.
- 19. D.** The area of a parallelogram is base \times height. Calculate $24 \times 17 = 408$ square inches.
- 20. F.** For direct variation with x^2 , $y = kx^2$ where k is the constant. Using $y = 48$ when $x = 4$, we get $48 = k(4)^2$, so $48 = 16k$, and $k = 3$. When $x = 6$, $y = 3(6)^2 = 3(36) = 108$.
- 21. A.** Evaluate each square root separately: $\sqrt{196} = 14$ and $\sqrt{81} = 9$. Therefore $\sqrt{196} - \sqrt{81} = 14 - 9 = 5$.
- 22. J.** The total number of marbles is $18 + 12 + 15 = 45$. The probability of selecting a green marble is $15/45 = 1/3$.
- 23. C.** For a right triangle, $\sin^2(\theta) + \cos^2(\theta) = 1$. If $\cos(\theta) = 12/13$, then $\sin^2(\theta) + (12/13)^2 = 1$, so $\sin^2(\theta) + 144/169 = 1$. Therefore $\sin^2(\theta) = 25/169$, and $\sin(\theta) = 5/13$ (positive since θ is acute).
- 24. G.** Solve the inequality $5x + 9 < 44$ by subtracting 9 from both sides: $5x < 35$. Divide both sides by 5: $x < 7$.
- 25. B.** The volume of a cylinder is $V = \pi r^2 h$. Substituting $r = 8$ and $h = 15$: $V = 3.14 \times (8)^2 \times 15 = 3.14 \times 64 \times 15 = 3,014.4 \text{ cm}^3$.
- 26. H.** For a right triangle with one leg $a = 24$ and hypotenuse $c = 26$, use the Pythagorean theorem: $a^2 + b^2 = c^2$. So $24^2 + b^2 = 26^2$, which gives $576 + b^2 = 676$. Therefore $b^2 = 100$, and $b = 10$.
- 27. D.** Substitute $x = 5$ into $(6x - 7)^2$. First calculate $6(5) - 7 = 30 - 7 = 23$. Then square: $23^2 = 529$.
- 28. F.** The sum of interior angles of a polygon with n sides is $(n - 2) \times 180^\circ$. For a nonagon ($n = 9$): $(9 - 2) \times 180^\circ = 7 \times 180^\circ = 1260^\circ$.
- 29. A.** If $4^{(x-1)} = 256$, recognize that $256 = 4^4$. So $4^{(x-1)} = 4^4$, which means $x - 1 = 4$, and therefore $x = 5$.
- 30. J.** Simplify $\sqrt{288}$ by finding perfect square factors. Since $288 = 144 \times 2$, we have $\sqrt{288} = \sqrt{(144 \times 2)} = \sqrt{144} \times \sqrt{2} = 12\sqrt{2}$.
- 31. C.** For an arithmetic sequence with first term $a_1 = 18$ and common difference $d = 9$, the n th term is $a_n = a_1 + (n-1)d$. For the 20th term: $a_{20} = 18 + (20-1)(9) = 18 + 171 = 189$.
- 32. G.** To add matrices, add corresponding elements. $M + N = [9+4 \ 6+3; 5+2 \ 8+5] = [13 \ 9; 7 \ 13]$.
- 33. B.** The volume of a sphere is $V = (4/3)\pi r^3$. Substituting $r = 12$ and $\pi \approx 3.14$: $V = (4/3) \times 3.14 \times (12)^3 = (4/3) \times 3.14 \times 1,728 = 7,234.56 \text{ cm}^3$.

- 34. H.** Calculate 9 factorial: $9! = 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 362,880$.
- 35. D.** The expression $(3x - 12)/(x^2 - 16)$ is undefined when the denominator equals zero. Factor the denominator: $x^2 - 16 = (x + 4)(x - 4)$. This equals zero when $x = 4$ or $x = -4$.
- 36. F.** If the angles are in ratio 1:3:5, let them be k , $3k$, and $5k$. The sum of angles in a triangle is 180° : $k + 3k + 5k = 180^\circ$, so $9k = 180^\circ$ and $k = 20^\circ$. The middle angle is $3k = 3(20^\circ) = 60^\circ$.
- 37. A.** For $f(x) = \sqrt{x + 8}$ to be defined (as a real number), the expression under the square root must be non-negative: $x + 8 \geq 0$, which means $x \geq -8$.
- 38. J.** If $\log_7(x) = 3$, then by the definition of logarithm, $7^3 = x$. Calculate $7^3 = 7 \times 7 \times 7 = 343$.
- 39. C.** The volume of a rectangular box is $V = \text{length} \times \text{width} \times \text{height}$. Calculate $V = 9 \times 11 \times 14 = 1,386 \text{ cm}^3$.
- 40. G.** To find the LCM of 18 and 30, list multiples. Multiples of 18: 18, 36, 54, 72, 90... Multiples of 30: 30, 60, 90... The least common multiple is 90.
- 41. B.** First evaluate $f(2) = 7(2) + 4 = 14 + 4 = 18$. Then evaluate $g(18) = (18)^2 - 6 = 324 - 6 = 318$.
- 42. H.** If the mean of nine numbers is 36, their sum is $9 \times 36 = 324$. The sum of the eight known numbers is $32 + 35 + 38 + 40 + 34 + 37 + 33 + 39 = 288$. The ninth number is $324 - 288 = 36$.
- 43. D.** In a 30-60-90 triangle, the sides are in the ratio $1:\sqrt{3}:2$. If the side opposite the 30° angle is 7 (this is the shortest side), then the hypotenuse is 2 times this length: $2 \times 7 = 14$.
- 44. F.** For inverse variation with y^3 , $x = k/y^3$ where k is the constant. Using $x = 16$ when $y = 2$, we get $16 = k/(2)^3$, so $16 = k/8$, and $k = 128$. When $y = 4$, $x = 128/(4)^3 = 128/64 = 2$.
- 45. A.** Find the GCF by using prime factorization. $135 = 3^3 \times 5$ and $180 = 2^2 \times 3^2 \times 5$. The GCF is $3^2 \times 5 = 9 \times 5 = 45$.

READING TEST

1. Suggested Passage Map notes:

¶1: Narrator (N) listens to wife Emily (E) talk to his twin brother Bruce (B) on phone

¶2-5: E says it's funny to think B knows celebrities

¶6: N thinks B's smile is better than his own

¶7-15: E says she likes N's smile better; B's smile looks practiced

¶16-20: N, an insurance adjuster, feels inferior to B, a Hollywood agent

¶21-26: E says B wants N's approval, N says it'll be fine either way

1. C

Difficulty: Medium

Category: Inference

Getting to the Answer: The author describes Dave, the narrator (“Bruce’s twin brother”), as seeming to regard Bruce as superior to him in many ways. Dave admires Bruce’s confident smile; seems to suggest that his wife should have married the more successful, glamorous brother; and says that people look at him “as if I did something wrong” (line 82). The author even mentions Dave’s insecurities (line 59). Dave lacks self-esteem, which matches (C). Choices A and B are out of scope because the author does not provide support for either of them. Choice D is opposite, since Dave speaks negatively when comparing himself to his brother.

2. **H**

Difficulty: Low

Category: Inference

Getting to the Answer: Emily has a good relationship with both brothers; she has an enjoyable conversation with Bruce and works to make Dave feel better. Also, she wants the brothers to be closer than they are. Because it reflects these details, (H) is the correct answer. Choice F is the opposite; Emily is very attentive. Choices G and J are both extreme and negative distortions of Emily's desire to help relations between the brothers.

3. **B**

Difficulty: Medium

Category: Detail

Getting to the Answer: This question is asking you to identify which answer choice is NOT represented in the passage, so the first step is to eliminate choices that ARE contained in the passage. In the first paragraph, Dave is envious of the reaction his wife has when talking to Bruce. This eliminates A. The paragraph about Dave's reaction to the picture captures his negative feelings regarding the difference in their popularity, eliminating C. The final conversation shows Dave as doubtful of Bruce's need for his approval, eliminating D. This leaves (B), which is not found in the passage and is therefore the correct answer.

4. J

Difficulty: Medium

Category: Function

Getting to the Answer: The first paragraph starts with a description of Emily on the phone, but the focus quickly shifts to Dave's reaction. It then moves to Dave's making some points about his brother's popularity and questioning whether his own wife has ever reacted so favorably to him. Choice (J) summarizes this well. Choices F and H are not found in the passage, and G occurs much later.

5. D

Difficulty: High

Category: Inference

Getting to the Answer: Emily attempts to make Dave believe that he is important to Bruce, but Dave still feels he is in Bruce's shadow. It is unclear whether or not Dave entirely believes Emily, but when she brings up Bruce's desire to talk about the brothers' childhood, Dave's response suggests that he does not want to talk about it because it again reminds him of how Bruce has always been the more popular of the two. This makes (D) the correct answer. Choice A is out of scope; the passage does not suggest that Dave does anything to spite Emily. Choice B is incorrect because Dave does not feel guilty; he sees Bruce's success as proof that it doesn't matter whether he calls Bruce or not. Choice C is out of scope; Dave's reasons for not calling Bruce have to

do with his feelings toward his brother, not any feelings related to Emily.

6. **H**

Difficulty: Medium

Category: Detail

Getting to the Answer: In lines 30–35, Dave explicitly talks about how Bruce’s image has positive aspects (vitality) that his image lacks. This is a perfect match for (H), which restates this generally. Choices F and J are not found in the passage, and G is contradicted by the fact that both Dave and Emily can tell the difference between the twins.

7. **D**

Difficulty: Medium

Category: Detail

Getting to the Answer: This is a NOT question, and because you can’t find something that isn’t there, you should look for the answer choices that are in the passage and eliminate them. Choice A is in line 63, where the narrator speaks of his brother as the famous one. On line 95, he compares his profession as an insurance adjuster with his brother’s career as a Hollywood agent, eliminating B. When he looks at the picture of himself and his brother, the narrator muses about the “unmistakable vitality in Bruce’s face that wasn’t present in mine” (lines 32–33), making C incorrect. The only choice left is (D), and

though it might be assumed that a Hollywood agent earns more than an insurance adjuster, this comparison is never made in the passage.

8. **F**

Difficulty: Medium

Category: Inference

Getting to the Answer: With an open-ended question like this, the answer choices must be individually tested. Choice (F) can be logically deduced, especially from the last exchange: Emily mentions that Bruce tells her stories about their childhood, and when Dave makes a comment about Bruce’s popularity, Emily responds that “[Bruce] doesn’t look at it that way” (line 96). This suggests that there is a difference between the two brothers’ childhood stories. Choice G is too extreme and better describes the reaction other people have to the different professions of Bruce and Dave. Choice H is also too extreme: Dave feels competitive with Bruce, but that does not imply that they have fought. Choice J is not supported by the text; their childhood is the only time when it is stated that they spent time together.

9. **B**

Difficulty: Medium

Category: Inference

Getting to the Answer: In this passage, the author describes Emily as concerned for her husband when she says, “You are my husband, and

I love the way you smile“ (lines 49–50). It’s Dave, not Emily, who has doubts about whether she married the right brother; Emily seems perfectly happy with the one she has. Match this with answer (B). Choice A is the opposite of Emily’s feelings as the author describes them. Choice C is out of scope because it is not supported by the information in the passage, and D is a distortion. Emily comments on the famous people her brother-in-law knows but does not indicate that she wishes she knew them too.

10. **F**

Difficulty: Medium

Category: Detail

Getting to the Answer: Emily follows her comment about Bruce’s stories by dismissing Dave’s comment about Bruce’s popularity, saying that Bruce “doesn’t look at it that way” (line 96). Her response is in reaction to Dave’s frequent comments suggesting that Bruce has been more successful socially and Dave’s implication that Bruce feels superior to Dave. This matches (F), which correctly restates this idea. Choice G is not supported by the passage, H is opposite because Emily wants Dave to focus less on his brother’s successes, and J is extreme because Bruce wants more attention from his brother but is not necessarily lonely.

2. Suggested Passage Map notes:

¶1: public wants heroes/villains more than facts

¶2: when only 3 channels, newscaster was national figure

¶3: impartial Internet news surrounded by biased headlines

¶4: press conferences present slogans instead of facts

¶5: public better informed but wants immediacy and consensus

11. **C**

Difficulty: Medium

Category: Global

Getting to the Answer: The author is critical of the media throughout the passage and focuses mostly on ways in which the current media is not concerned enough with factual accuracy. Choice (C) matches this nicely. Choice A is too extreme; the author talks about distorting facts, not making them up. Choice B contradicts the third paragraph, which characterizes some news personalities as demagogues with biased views. Choice D contradicts the fourth paragraph; the public's desire for this type of news is one of the reasons for its existence.

12. **H**

Difficulty: Medium

Category: Function

Getting to the Answer: It might seem odd to open a passage about the news media with a reference to what berries are edible, but the author does this as a general introduction to the kind of information, or news, that has always been important to people. After rereading the applicable part of the passage, predict that edible berries are an example of a food that is safe to eat and that ancient demand for news about the edibility of berries is an example of “the information most sought after [being] that regarding personal safety” (lines 4–5). Choice (H) is a perfect match for that prediction. Choice F is out of scope, and G and J are misused details.

13. **B**

Difficulty: Medium

Category: Function

Getting to the Answer: The sentence preceding the Walter Cronkite example states that audience members expected to have complicated events explained to them; the Cronkite example follows this logic. Choice (B) matches this perfectly. Choice A may be inferred, but it is not the point the author is making—the author’s concern is the treatment of the news, not specific news personalities. This reasoning also eliminates C. Choice D is never mentioned in or suggested by the passage.

14. **F**

Difficulty: Medium

Category: Inference

Getting to the Answer: In order to research this statement, it is a good idea to look back at the fourth paragraph because it discusses the public. “Personal consensus” applies to the author’s point about people looking for news reported by someone with a political opinion similar to their own. Choice (F) matches this. Choices G and J are both contradicted by information given in the fourth paragraph. Choice H is not supported by the passage and contradicts the author’s main point.

15. **B**

Difficulty: High

Category: Detail

Getting to the Answer: In the first paragraph, the author states that in stories of “continued national interest” (line 9), the focus shifts from facts to “theater” (line 11). Choice (B) is the best match. Choices A, C, and D are not explicitly mentioned as more or less likely to be sensationalized.

16. **J**

Difficulty: Medium

Category: Vocab-in-Context

Getting to the Answer: The sentence describes objective reporting as a “distant possibility.” Questions like this are easier if you pick a word

that means the same thing in context. In this case, you can predict *improbable* or something similar. This matches (J) perfectly. Choices F, G, and H do not address the likelihood of objective reporting.

17. **C**

Difficulty: Medium

Category: Inference

Getting to the Answer: The author is most likely to criticize a headline that sensationalizes or makes a value judgment, and the end of the third paragraph gives an example. Choices A, B, and D are all basically factual and specific. Choice (C) is correct because it refers to a very broad group (like the example in the third paragraph does), makes a value judgment by calling the song offensive, and uses emotional language.

18. **J**

Difficulty: Low

Category: Detail

Getting to the Answer: The fourth paragraph focuses on the flaws of the public and states that individuals who agree with certain politically biased hosts are unlikely to question the validity of the “facts” presented. This matches (J) perfectly. Choices F and G are not explicitly stated by the author. Choice H is the opposite of the author’s

contention that viewers do not want to draw their own conclusions and prefer to just accept information as fact.

19. **A**

Difficulty: Medium

Category: Inference

Getting to the Answer: Overall, the author criticizes news media for emphasizing personalities and opinions rather than facts and clear-eyed consideration of their implications. He mentions niche markets in the context of the “personalities willing to shrug off accountability in favor of wild accusations and bombastic slogans,” once again accusing the media of ignoring facts in order to “reel in the public” (lines 106–107). The author’s overall feeling is that news media cater to what the public wants, which is what (A) states. Choice B is opposite; according to the author, the news media are not willing to present objective facts. Choice C is out of scope because the author is not concerned with marketing practices, and it can be inferred that D is also opposite since the author feels that news media reflect what the audience wants, which may or may not be greater exposure to facts.

20. **J**

Difficulty: Low

Category: Vocab-in-Context

Getting to the Answer: As with all Vocab-in-Context questions, the clues are in the sentences surrounding the word. Here the author is contrasting the “objective, trustworthy anchorperson” (line 33) with “vociferous demagogues” (line 34), the latter of which comes with a negative connotation. Given that H, which is positive, can be immediately eliminated. All other answer choices are negative, but think about the author’s general point of view. The author doesn’t write that reporters are angry but that they are biased, making F incorrect; and there is no suggestion that they are incompetent, eliminating G. The only choice left is (J), the correct one. *Vehement* and *vociferous* are synonyms, both of which mean “loudly insistent.”

3. Passage A

¶1: Joyce (J) describes Dublin in *Ulysses* (*U*)

¶2: *U* focuses on mundane details

¶3: *U* considered globally appealing, represents human cond.

Passage B

¶1: best authors didn’t waste time on trivial details

¶2: *U*’s focus on details = undignified

¶3: J isn’t bad writer, just in bad era

21. C

Difficulty: Medium

Category: Global

Getting to the Answer: You should have already noted the main ideas of the passages, so all you need to do here is think about what statements could hinder the main idea of Passage A. The main idea of Passage A is that Joyce, despite or even because of the specific local detail in his work, has managed to create works of universal truth and appeal. Predict that the correct choice will somehow suggest a lack of ability to generate such widespread appeal, leading you to (C) as the correct answer. Choice A is a misused detail; though this author briefly mentions historical events in novels, the idea is not at all central to his point. Choice B is opposite; this might actually help the author's point, as it speaks to universal human ideals. Choice D is opposite; as is the case with B, this statement might actually help the author's point.

22. J

Difficulty: Medium

Category: Inference

Getting to the Answer: Use a paraphrase as your prediction, but keep in mind that the answer choices may be written in more general language. Here, the quoted phrase talks about escaping the boundaries of time and place to concentrate on greater truths that are independent of these factors. Expect to find a similar paraphrase among the answer choices, leading you to (J) as the correct answer.

Choice F is opposite; the author is talking about revealing universal truths, not “specific” details. Choice G is out of scope; this author never claims that Joyce wrote in such a way as to “obscure information.” Choice H is a distortion; although “ignoring setting” gets close to the right idea, focusing on “character” is not under discussion at this point.

23. **A**

Difficulty: Medium

Category: Detail

Getting to the Answer: When answering a NOT question, identify the option that does not appear in the passage. Passage A praises Joyce’s focus on the common man and his daily life, concluding that it “appeal(s) to the entirety of the human dilemma” (lines 43–44). The author gives examples of this focus by citing the fact that Joyce frequently set his stories in Dublin, which eliminates B, that he wrote of “the minor struggles and idle musings of an ordinary Irishman,” (lines 40–41), eliminating C, and that, as stated above, it reflects the human dilemma, making D incorrect. The only answer that is not a theme in *Ulysses* is (A), heroic deeds. Indeed, the author of Passage B specifically criticizes Joyce for not writing “of a noble hero’s struggle” (lines 79–80).

24. **F**

Difficulty: Medium

Category: Detail

Getting to the Answer: One of the main criticisms in the first paragraph of Passage B is that Joyce’s subject matter is more base and common than that of earlier authors. Use this idea as the foundation for your prediction, leading you to (F) as the correct answer. Choice G is out of scope; the author of Passage B never questions Joyce’s factual knowledge. Choice H is opposite; if anything, Passage B argues that Joyce is too unlike his predecessors. Choice J is out of scope; the author of Passage B never makes claims about the elegance of Joyce’s prose.

25. **C**

Difficulty: Medium

Category: Detail

Getting to the Answer: The author of Passage B criticizes Joyce for his themes and attention to common activities, but in the last paragraph, the author concedes that “Joyce is no slouch as a wordsmith” (lines 90–91). The author adds that had Joyce been writing in a “more dignified era,” (lines 92–94), his talent would have been put to better use. Thus, in the long run, the author admits that Joyce was a talented writer, as (C) states. The author might believe that Joyce was a product of his time, but that doesn’t support him as a good writer, making A incorrect. Choice B is out of scope; the author doesn’t say this, and D is opposite. The author holds up Dickens as an example of an excellent writer whose themes and goals are quite different from Joyce’s.

26. **F**

Difficulty: Medium

Category: Vocab-in-Context

Getting to the Answer: Don't be fooled by familiar words; the challenge of questions like this is in the particular context, not the vocabulary itself. Here, the author uses *base* to describe crude details Joyce often includes, so you should predict something such as *tasteless*, which matches (F), unrefined. Choice G is a distortion because it refers to the primary definition of the word. Choice H is a misused detail, referring to the phrase "virtually nauseating" later in the paragraph. Choice J is opposite; the author of Passage B is critical of Joyce's tendency to discuss unrefined activities.

27. **B**

Difficulty: High

Category: Inference

Getting to the Answer: Passage B criticizes Joyce for failing to provide enlightenment for readers, but Passage A has a favorable opinion of Joyce. The author of Passage A discusses how Joyce's works are globally appealing, which matches (B). Choice A is out of scope because Passage A does not discuss the level of enlightenment provided by older works. Choice C is opposite; the author of Passage A believes that Joyce's inclusion of details enhances his writing. Choice

D is out of scope because Passage A does not address philosophical questions.

28. **H**

Difficulty: Medium

Category: Global

Getting to the Answer: Although the question stem asks you to compare the passages, all you really have to do is summarize each author’s opinion separately. Passage A is generally favorable towards Joyce, commending him for evoking many universal truths, while Passage B is mostly unfavorable, viewing him as undignified. Use this as the basis for your prediction, which leads you to (H) as the correct answer. Choice F is opposite; the author of Passage A actually considers Joyce a great author, and “inaccuracy” is not really a criticism that Passage B employs. Choice G is opposite; similarly, this is incorrect because the author of Passage A promotes Joyce’s “significance” as a writer. Choice J is a distortion; while Author B does mention Joyce’s skill, Author A never laments any aspect of the writing nor deems it “irrelevant.”

29. **B**

Difficulty: Low

Category: Inference

Getting to the Answer: Keep in mind the authors' general attitudes towards Joyce as you assess their tones at these particular points in the passages. In Passage A, the author is complementing the great degree of detail Joyce uses in describing Dublin, whereas the author of Passage B is expressing disgust at having to read the details of what he considers vulgar or insignificant acts. Use these tones as the basis for your predictions. Choice (B) is correct; this matches the perspectives of the authors. Choice A is a distortion; although both choices here get the general charge right, neither word is quite appropriate to the specific tone of each author. Choice C is a distortion; again, this choice gets the general positive/negative aspects of tone right, but the specifics aren't a good match with each author's attitude. Choice D is opposite; "glee" is contrary to the second author's tone.

30. **G**

Difficulty: High

Category: Inference

Getting to the Answer: The correct choice is likely to involve Passage B's main claim about Joyce's undignified writing. Choice (G) is correct; Passage B argues that Joyce's writing was not exemplary. Choice F is opposite; both authors agree that Joyce was of Irish descent. Choice H is out of scope; the author of Passage B is rarely complementary to Joyce, making this an unlikely choice. Choice J is out of scope; a mystic is someone concerned with religion or the occult, a choice inappropriate for either passage's discussion.

4. Suggested Passage Map notes:

¶1: rattlesnake (r) thought of as evil

¶2: r has bad reputation

¶3: not cannibals & are monogamous

¶4: 1st instinct = retreat

¶5: low death rate

¶6: majority of bites are “dry” (no venom)

¶7: 100,000 r killed per year

¶8: r should be afraid of humans

31. **B**

Difficulty: Medium

Category: Inference

Getting to the Answer: The passage is most concerned with discrediting the myth that rattlesnakes are aggressive and very dangerous, and the selection refers to exactly that: the “sinister opportunist” is the myth, while the “mild-mannered domestic” is closer to fact. Choice (B) can be deduced from this. Choice A is

incorrect, as juvenile snakes are not even mentioned. Choice C misuses the detail about rattlesnakes' giving live birth, which is not treated as a recent discovery. Choice D is too extreme; the author describes rattlesnakes as fairly docile but not entirely predictable.

32. **G**

Difficulty: High

Category: Inference

Getting to the Answer: The author is sympathetic to rattlesnakes since the author provides several pieces of evidence that disprove the general fear and hatred of them. The real problem is raised in the difficult vocabulary of the answer choices, so use what you know of word prefixes and charge to get a general understanding of the words. First, since the author's view of rattlesnakes is essentially positive, eliminate all negatively-charged words. The "a" in *apathetic* indicates "away," so *apathetic* means something like "away from sympathy," making F incorrect. Choice H looks very much like the word *frighten*, so assume that it also has a negative charge and eliminate it. In choice J, "anta" is related to *anti*, meaning "against," and once again indicates a negative word. That leaves choice (G), and even if you did not know that *solicitous* means "sympathetic" or "caring," it is the only answer left and must be correct.

33. **C**

Difficulty: Medium

Category: Detail

Getting to the Answer: The passage gives quite a few examples of the social behavior of rattlesnakes, so be prepared to find a restated fact among the answer choices. Choice (C) fits this nicely, because the second paragraph states that rattlesnakes have been known to hibernate with tortoises. Choice A is not a social behavior. Choice B goes beyond the text; the wrestling is used to claim a mate, but the losing snake will leave, rather than take a place within a hierarchy. Choice D also misuses a detail; rattlesnakes are described as “entirely noncannibalistic” (lines 21–22), meaning they never eat other snakes.

34. **H**

Difficulty: Medium

Category: Inference

Getting to the Answer: The mythology referred to is that of the heartless, aggressive rattlesnake. This relates to rattlesnake roundups (line 103) to which the author clearly objects, so it would follow that the author sees this particular human behavior as heartless and aggressive. Choice (H) matches this perfectly, and the statistical comparison in the seventh paragraph supports this. Choice F contradicts the author’s belief that rattlesnakes are not as dangerous as commonly thought. Choices G and J do not relate to the point the author is making.

35. **C**

Difficulty: Medium

Category: Detail

Getting to the Answer: The seventh paragraph states that “people are frequently bitten at the festivals while handling snakes for the audience” (lines 109–111), which matches (C). Choice A is incorrect because a relationship is mentioned. Choice B is not mentioned in the text. Choice D is a distortion because rattlesnakes deliver venom based on how threatened they feel, not necessarily based on how threatening humans act.

36. J

Difficulty: High

Category: Function

Getting to the Answer: The author defines dry bites as those without venom and says that “Over half of the bites rattlesnakes administer to humans are ‘dry’” (lines 81–83). This being the case, they are not as dangerous as bites that inject venom, disproving the popular belief that all rattlesnake bites are potentially fatal. Having predicted this, match it to (J). Choice F is incorrect both because it is an extreme (the word *prove* is extreme) and because it is the opposite of what the author says. Choice G is incorrect because the author does not say that rattlesnakes do not have enough venom to inject into a person, and H is incorrect because the author admits that under the right conditions, rattlesnakes can, indeed, harm humans.

SCIENCE TEST

1. *Passage I*

1. C

Difficulty: High

Category: Data—Detail & Interpretation

Getting to the Answer: For almost the first 1,000 years plotted in Figure 1, calving rate steadily decreased while glacier length remained roughly constant. This contradicts A and B, so both choices can be eliminated. At the sharp peak around 1,500 years, however, there is a dramatic increase in calving rate and an equally dramatic decrease in glacier length. Choice (C) is thus correct.

2. H

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: Because the meteorologists proposed a direct relationship between calving rate and change in sea level, this

question is really just asking you to find the glacier from Table 1 with the largest calving rate for years 6–10. According to the final column of the table, Glacier C had a calving rate of 312 m/yr during those years, far greater than the rates of the other glaciers, making (H) correct.

3. **B**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: According to Table 1, all 4 glaciers during both time periods had calving rates that were equal to or slightly greater than their average velocities. While none of the glaciers from Table 1 had a velocity of 80 m/yr, during years 1–5, glaciers A and C had velocities of 72 m/yr and 98 m/yr, respectively, with calving rates of 72 m/yr and 106 m/yr, respectively. Therefore, a glacier traveling at 80 m/yr could be expected to have a calving rate somewhere between 72 m/yr and 106 m/yr, as in (B).

4. **J**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: Because there are few clues in the question stem, you'll probably want to use process of elimination to home in on the correct answer. Choice F is contradicted by the behavior of Glacier C in Table 1, while G is contradicted by the behavior of the other

glaciers. Even though calving rate is equal to average velocity in the first 5 years for Glacier A, all of the other data in Table 1 feature calving rates that are higher than average velocity. This allows you to eliminate H and to recognize that (J) must be correct.

5. **B**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: Don't be thrown off by the strange scale of the horizontal axis of each choice: the labeled x -values correspond exactly to the calving rates for years 6–10 given in Table 1. Simply find the graph that correctly plots the 4 data points from the last 2 columns of the table. You can do this by selecting test points and eliminating choices that don't include them, or by looking for the 1 graph that consistently shows the direct relationship evident from Table 1, in which every increase in calving rate corresponds to an increase in average velocity. Either way, you'll find that choice (B) is correct.

6. **H**

Difficulty: Low

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: The meteorologists in Study 3 hypothesized that high temperatures cause rapid variations in velocity and calving rate. Figure 1 shows a rapid change in calving rate at around 1,500

years. If the hypothesis is true, then the glacier modeled in Study 1 would have been subject to high temperatures at about 1,500 years, meaning (H) is correct.

7. **B**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: The question is asking you to identify 2 specific values—the glacier length and the calving rate—from Figure 1. To get to the answer, find 1,500 years on the x -axis and draw a vertical line extending upward. Find where the vertical line intersects with the glacier length curve and draw a horizontal line back to the y -axis on the left side to find that the glacier length is approximately 23 km. This allows you to eliminate A and D. Next, find the point where the calving rate line intersects with the vertical line you drew at 1,500 years, and draw another horizontal line over to the y -axis on the right side to find that the calving rate is about 125 m/yr. Choice (B) is thus correct.

9. *Passage II*

8. **H**

Difficulty: Low

Category: Data—Inference & Calculation

Getting to the Answer: The question stem states that the air filters greatly reduce rhinitis symptoms and asks which month would have the greatest decrease in the number of rhinitis cases. To reach the answer, look at Table 1 and find the month among the 4 listed in the answer choices with the greatest total number of cases. September has far more cases than any of the other 3 months, so it would definitely see the greatest decrease in rhinitis cases if patients used the filters. Choice (H) is correct.

9. **C**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: To answer this question, just find the relevant value from Figure 1. The bar for March 2 in Figure 1 rises to approximately $1,500 \text{ gr/m}^3$, so (C) is correct.

10. **H**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: The question stem asks you to describe the mold spore count in Figure 2 for the weeks after November 5. The spore counts for these weeks fluctuate without a clear trend, but they do stay within a relatively small range of values, as is correctly described in (H).

11. **B**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: Be careful to answer the correct question: “increased the most” doesn’t necessarily mean the count increased to its largest value, which is the trap set in C. Choice D is also a trap because it relies upon Figure 2 rather than Figure 1. The largest increase in Figure 1 occurs between February 23 and March 2, as in (B).

12. **F**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: This question asks about the tree pollen count graphed in Figure 1. The largest value for tree pollen count is found on March 9, so (F) is correct. March 16 has neither the highest nor the lowest count, which makes both G and J incorrect. Choice H is incorrect because the first 4 dates in the graph have lower values for tree pollen count than the one from February 23.

13. **A**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: To answer this question, find the row in Table 1 for the month of May and look for the corresponding column(s) containing the most reported cases of allergic rhinitis (the most ⌘ symbols). Tree and grass pollen account for 6 of the 9 total ⌘ symbols in May, a majority of the allergic rhinitis cases. Choice (A) is thus correct.

6. *Passage III*

14. **G**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: Notice that in Figure 3, the lines plotted for Springs B, C, and D intersect at approximately the same mass, which means that their equilibrium lengths are roughly equal there. The exact mass value is not completely clear from the figure, but it appears to be greater than 200 g but less than 300 g, which means that choice (G) must be correct.

15. **A**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: The curve in Figure 1 is not linear, but it still shows a general trend of the oscillation frequency decreasing as the

arm length increases. Thus, the student's hypothesis would be supported, which eliminates C and D. Choice (A) provides an accurate explanation, so (A) is the correct answer.

16. **F**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: As noted in the passage, oscillation frequency is measured in “oscillations per second”—the faster the spring oscillates, the more oscillations it will complete per second. Thus, the slowest spring will be the one with the lowest value for oscillation frequency. Regardless of the mass attached, Spring A always has the lowest value for oscillation frequency, so choice (F) is correct.

17. **C**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: Refer to the line plotted for Spring A in Figure 3. On that line, a mass of 700 g corresponds to an equilibrium length of approximately 40 cm. Choice (C) is therefore correct.

18. **J**

Difficulty: High

Category: Data—Detail & Interpretation

Getting to the Answer: According to Figure 2, an oscillation frequency of 1.4 Hz at a mass of 100 g would be represented by a data point that would fall in between the frequency values for Spring C and Spring D at that mass. Only choices H and (J) place Spring E between Springs C and D, and (J) correctly lists the springs in order of *decreasing* oscillation frequency.

19. **C**

Difficulty: High

Category: Thinking Like a Scientist—Applying Core Knowledge

Getting to the Answer: The effects of mass are not mentioned in Experiment 1, so this question requires some background knowledge in physics to answer correctly. While the pendulum arm length will affect the oscillation frequency, the mass attached has no impact on the oscillation frequency of a pendulum, so the plots for the original mass and the larger mass should be identical, as in (C).

20. **H**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: Figure 1 shows the relationship between arm length and oscillation frequency. To find the corresponding arm

length, draw a line from 0.35 on the y -axis to the curve. At the point of intersection, draw a line down to the x -axis. The line will be closer to 20 than 15, which is why the correct answer is 19 cm, choice (H).

4. *Passage IV*

21. **D**

Difficulty: Low

Category: Data—Inference & Calculation

Getting to the Answer: Look at the first 3 rows and last 3 columns of Table 1 to find the enzyme concentration values of populations ha 1, ha 2, and ha 3. The table shows that for all 3 high-altitude populations, GST levels are highest, CR levels are lowest, and ECH levels are in between. Because GST is always higher than CR for these high-altitude populations, (D) is correct.

22. **G**

Difficulty: Low

Category: Data—Inference & Calculation

Getting to the Answer: This question asks you to compare high-altitude and sea-level dwellers, so use the table and figure provided to evaluate each choice. Choice F is not always true; the oxygen saturation percentages provided in Table 1 are pretty similar for high-altitude and sea-level dwellers. Figure 1 shows that oxygen partial

pressure and temperature both decrease at higher altitudes, so it would not be reasonable to conclude that sea-level dwellers can tolerate lower oxygen partial pressures or lower temperatures compared to those who dwell at higher altitudes. Choices H and J can thus be eliminated. Choice (G), however, is directly supported by the data in Figure 1 that shows consistently lower GST values for sea-level dwellers, making (G) the correct answer.

23. **C**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: The answer to this question comes directly from Figure 1, but you must be careful not to confuse the 2 data sets. Draw a horizontal line from 110 mm Hg on the left vertical axis until it intersects with the oxygen partial pressure data (the line with square points). That intersection happens at about 3,200 m. To find the temperature at this altitude, draw a horizontal line from the temperature plot (the line with circular points) at 3,200 m to the right axis. It intersects somewhere between -5°C and -10°C , meaning the correct answer must be (C). Choice A is a trap that you might select if you accidentally reverse the 2 data sets.

24. **H**

Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: Though the question stem provides a lot of new information, it is essentially asking you simply to find the population with the highest ECH concentration. The value of 93.5 a.u. for population ha 2 is higher than any other population's ECH concentration, making (H) correct.

25. **A**

Difficulty: High

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: The question stem tells you to assume that only oxygen partial pressure and respiratory efficiency influence oxygen saturation percentage, and it asks you to identify what information would support the idea that population ha 2 has greater respiratory efficiency than population sl 1. The easiest way to make this case would be to show that the other factor, oxygen partial pressure, could not possibly account for the fact that ha 2 has a higher saturation percentage than sl 1. And indeed, according to Figure 1, the oxygen partial pressure at 3,300–3,700 m (where ha 2 lives) is considerably lower than the oxygen partial pressure at 0–300 m (where sl 1 lives). Because this fact supports the hypothesis from the question stem, (A) is correct. Choices B and D are incorrect because they contradict the information from the passage, while C is incorrect because neither the passage nor the question stem suggests a connection between CR concentration and respiratory efficiency.

26. **J**

Difficulty: High

Category: Data—Inference & Calculation

Getting to the Answer: The question requires you to identify the relationships between altitude and enzyme levels, then predict the levels for a population that lives at an altitude of 1,500–1,800 m, squarely in between the high-altitude and sea-level populations studied in the passage. According to Table 1, GST and ECH levels are consistently higher for the high-altitude populations than for the sea-level populations, while CR levels are roughly constant regardless of altitude. Consequently, it makes sense to predict that the GST and ECH levels of the new population will be higher than those of the sea-level populations but lower than those of the high-altitude populations, while its CR levels would be roughly the same as those of both groups. Choice (J) is thus correct.

1. *Passage V*

27. **D**

Difficulty: Medium

Category: Experiments—Synthesizing Data

Getting to the Answer: In the passage, Student 1 cites the fact that “the freezing point of water decreases with increasing pressure,” and then suggests that, “Under the surface, *hydrostatic pressure* causes the freezing point of water to be slightly lower than it is at the surface.” For

hydrostatic pressure to cause a decrease in freezing point, it must be higher under the surface, as stated in (D). Choice A is incorrect because it contradicts Student 1’s explanation, which suggests that temperature is roughly constant throughout the lake. Choices B and C are incorrect because they are aspects of Student 2’s explanation.

28. **G**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: According to Student 1, pressure causes the ice under ice skates to melt and pressure increases with increasing weight. Student 2 states that friction causes the ice to melt and that the force of friction increases with increasing weight. Therefore, the students would agree that ice would melt faster under the heavier skater, as suggested in (G).

29. **A**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Student 1 explains that the ice under ice skates melts due to increased pressure—specifically, having the force of the entire weight of the skater’s body distributed over the tiny surface area of the blades of the skates. This heightened pressure would persist regardless of whether the skater is moving, so Student 1

would predict melting from a stationary skater. This allows B and D to be eliminated. Student 2, however, states that “energy used to overcome the force of friction is converted to heat, which melts the ice under the skates.” Overcoming the force of friction requires motion, so a stationary skater would generate no heat, suggesting that the ice would not melt on Student 2’s account. Because only Student 1 predicts melting under a stationary skater, (A) is correct.

30. **H**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Student 2 explains that less dense materials float above more dense materials. On this account, for the frozen ethanol to sink to the bottom, it must be denser than liquid ethanol, making (H) the correct answer. Choice J is the opposite, while F and G are irrelevant because the frozen ethanol described in the question stem does not interact with either liquid or frozen water.

31. **C**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: You can eliminate A and B due to the mention in both of pressure, which is a concept only Student 1 discusses. Student 2 explains that ice floats on water because “the *buoyant*

force of water acting upward is greater than the force of gravity pulling any mass of ice downward.” Thus, for an object to sink in water instead, its weight (the force of gravity on that object) must exceed the buoyant force of water on that object, which is precisely what is described in (C).

32. **G**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Eliminate F because only Student 1 considers pressure, and eliminate J because Student 1 is the only one who discusses how the freezing point of water could change. Choice H can also be eliminated because the force of gravity will only decrease if the mass of the skater decreases, but this is not required by the question as posed (while decreasing the mass of the skater would be one way to decrease the friction, it is not the only way). Choice (G) must be correct, and this is confirmed by Student 2’s statement that “energy used to overcome the force of friction is converted to heat”—less friction means less energy required to overcome friction, which means less heat produced.

33. **A**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Recall that Student 2 explains that ice floats on water because it is less dense. Thus, based on the same principle, for a hot air balloon to rise above the surrounding air, it must be less dense than that air, which is precisely what is stated in (A). Choices B and D are both incorrect because they state the opposite (the term *buoyant* is included in D to make it seem more appealing, but “less buoyant” means effectively the same thing as “more dense”). Choice C is incorrect because it involves pressure, which only appeared in Student 1’s account.

9. *Passage VI*

34. **F**

Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: According to the measured conductivity column of Table 1, there is conductivity even in a sample in which F^- is not present. The first paragraph of the passage notes, however, that the students conducting the experiments were interested simply in measuring fluoride levels. Subtracting the conductivity of the sample with no fluoride ions from the other measured values allows the students to determine how much conductivity is due exclusively to F^- . Choice (F) is thus correct. Choice G is incorrect because the correction is applied after the data has already been collected, so it could not be used to calibrate the cells. Choice H is out of scope because the passage does not mention the presence of impurities and non-ionic

molecules do not conduct electricity. Choice J is incorrect because solubility is never discussed in the passage and is not a factor in the experiments.

35. **C**

Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: Either Table 1 or Figure 1 can provide the answer here. Table 1 contains examples of cases in which the F^- concentration is indeed doubled (from 0.5 mg/L to 1 mg/L, for example) and gives the corresponding change in conductivity. Taking care to look in the *corrected* conductivity column, you can see that 2 times the concentration results in 2 times the corrected conductivity. Likewise, Figure 1 makes it clear that relationship between the 2 quantities is linear, which means that any multiplication of the concentration results in the same multiplication of the conductivity. Choice (C) is correct.

36. **J**

Difficulty: Low

Category: Experiments—Synthesizing Data

Getting to the Answer: Table 1 and Table 2 both show that there is a direct relationship between measured conductivity and fluoride ion concentration, so ordering the locations by concentration merely

requires ordering them by conductivity values. According to Table 2, Newton and Lakewood had conductivity values of 22.31 $\mu\text{S}/\text{cm}$ and 18.63 $\mu\text{S}/\text{cm}$, respectively. Thus, in increasing order of F^- concentration, you find Lakewood, Bluewater, and Newton, as in choice (J).

37. **C**

Difficulty: Medium

Category: Data—Inference & Calculation

Getting to the Answer: Refer to Table 1 to see where a value of 3.0 mg/L would fit in. This new concentration is between the 2.0 mg/L and 4.0 mg/L values given in the table, so the corrected conductivity should lie midway between 3.34 $\mu\text{S}/\text{cm}$ and 6.68 $\mu\text{S}/\text{cm}$. Choices B and D are too close to the extremes of this range, but (C) is almost precisely in the middle, as it should be. Alternatively, you could also find that (C) is correct by looking at Figure 1 and seeing that a fluoride concentration of 3.0 mg/L corresponds to a corrected conductivity of about 5.0 $\mu\text{S}/\text{cm}$.

38. **F**

Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: This question requires you to modify Experiment 1 to investigate chloride conductivity rather than fluoride

conductivity. According to the original description of Experiment 1, solutions were prepared by dissolving Na_2SiF_6 in H_2O , which produced F^- ions. To study Cl^- conductivity, the students would need to use a chemical that produced Cl^- ions instead. Choice (F) is thus correct. Choice G is incorrect because it would still be necessary to subtract the blank solution's conductivity to find corrected conductivity values that accounted only for the chloride ions. Choice H is incorrect because resistivity is simply the inverse of conductivity, so this change would just add an extra step in the calculation of conductivity values. Choice J is incorrect because the solutions produced would contain both F^- and Cl^- , which would make it difficult to isolate the conductivity of the chloride ions alone.

39. **B**

Difficulty: Low

Category: Data—Inference & Calculation

Getting to the Answer: The last sentence of the description of Experiment 1 explains that the corrected conductivity is calculated by *subtracting* the measured conductivity of the blank solution. Because the conductivity of the blank solution is a positive number, this always results in the corrected conductivity's being less than the measured conductivity, as in (B).

40. **F**

Difficulty: Medium

Category: Data—Inference & Calculation

Getting to the Answer: According to the description of Experiment 2, the students utilized “measured conductivities and the results from Experiment 1 to calculate fluoride ion concentrations.” To do this, they would first have to subtract the conductivity of Experiment 1’s blank solution from the measured conductivities of the samples to find corrected conductivity values. Then, they could use the graph they plotted in Figure 1 to move from corrected conductivity to F^- concentration. However, as explained in the question stem, the presence of Cl^- ions in the samples would result in increased values for measured conductivity. This, in turn, would lead to higher values for corrected conductivity and (due to the direct relationship between corrected conductivity and fluoride concentration) to greater values for the calculated F^- concentrations. These calculated values would be higher than the actual values, because a component of the measured conductivity used to calculate them would actually be due to Cl^- , and not just F^- . Choice (F) is thus correct.

WRITING TEST

Model Essay

Below is an example of what a high-scoring essay might look like. Notice that the author states her position clearly in the introductory paragraph and supports that position with evidence in the following

paragraphs. The essay also uses transitions, some advanced vocabulary, and an effective “hook” to draw in the reader.

Teachers often tell us that learning is fun, and the best way to convince us that learning is enjoyable is to give us activities that keep us engaged (and awake). The issue here is whether teachers should provide more hands-on learning experiences because doing so would help all students learn and remember better. On the other hand, others say that it’s possible to learn without doing and that schools should use their money for other educational purposes rather than trying to make everything hands-on learning. I believe that the best learning comes from hands-on work.

I know from experience that I learn better when I can actually do something myself. When students do projects such as growing plants, they really learn about the science because they are part of making that science work. This is analogous to learning how to ride a bike. A child can read about it, watch videos on it, and even watch someone actually ride a bike, but he doesn’t learn how to do it until he gets on a bike and pedals away. Thus, it is important that the teacher provide opportunities for students to do as much hands-on learning as possible. However, those who think that students don’t learn anything unless they actually do it are wrong. There are ideas that can’t be experimented with. How can students re-create the Big Bang or evolution? But just because they can’t actually do this doesn’t mean students don’t learn. There is a lot that can be learned from reading and learning from experts. However, if there is a choice between learning by doing and not having that opportunity, learning by doing is the better way to teach and learn.

On the other hand, other people think that experiential education is important only for students who will work in a career that requires that they do things themselves, such as engineering and technology. It is important that students who will enter careers that are skill based have the opportunity to practice this in school. School is supposed to teach what is needed for students later in life, and knowing how to do experiments or re-create what others have done should be part of this. But the people who argue for this say it is important only for students who will need it in their future careers. This means that some students, particularly those who don't know what career they want, will not get the benefit of hands-on experiences. That splits students into two groups: those who learn by doing and those who don't. All students learn well by doing, so it would not be fair to offer it only to some students. How can teachers know what is appropriate for students in their future careers if even the students don't yet know? This solution is not a good one because it assumes things that can't be supported.

Finally, it is shortsighted to argue that rather than create opportunities for hands-on learning, schools should spend their money on other things because learning by doing is expensive and may not be good for all students. There's always the problem that not all students learn in the same way so there's no one kind of learning that is best for everyone. But that doesn't mean teachers shouldn't provide hands-on opportunities. Actually, this is a good way to reach all students because it involves working with your hands, maybe some reading and talking too, and critical thinking, so it uses lots of ways of learning. It is foolish to have the opportunity to do something important and not do it just because some

people may not benefit from it or it will cost money. Teachers should give students the opportunity to learn in a hands-on way as much as possible.

In the real world, when we need to learn something new, like how to cook or use a computer program, if it's possible to learn by doing while having someone help and direct us, that is the best way to learn and the way that schools should teach. Studies, and my own experience, show that everyone can benefit from hands-on education; that is the way we learn and remember best.

You can evaluate your essay and the model essay based on the following criteria:

- Is the author's own perspective clearly stated?
- Does the body of the essay assess and analyze each perspective?
- Is the relevance of each paragraph clear?
- Does the author start a new paragraph for each new idea?
- Is each sentence in a paragraph relevant to the point made in that paragraph?
- Are transitions clear?
- Is the essay easy to read? Is it engaging?
- Are sentences varied?
- Is vocabulary used effectively?
- Is college-level vocabulary used?