FULL-LENGTH PRACTICE TEST 1

English Test

TIME: 45 minutes for 50 questions

DIRECTIONS: Following are five passages with underlined portions. Alternate ways of stating the underlined portions come after the passages. Choose the best alternative; if the original is the best way of stating the underlined portion, choose NO CHANGE.

The test also has questions that refer to the passages or ask you to reorder the sentences within the passages. These questions are identified by a number in a box. Choose the best answer and shade in the corresponding oval on your answer sheet.

Passage 1

Personal Trainers Help Drop Pounds

When it comes to losing weight fast; some (1) methods are more effective than others. For those who are serious about slimming down in a short amount of time, one of the easiest ways is to hire a personal trainer.

Because there's no standard of licensure for the profession, it's critical (2) that you do your homework prior to hiring one. (3) [4] Seek out a certified fitness professional — ideally, someone who is able to communicate well and clearly. (5) You also may want to pick someone whose physique mirrors one that you want for yourself. For example, (6) if you're inspired by your trainer, you're more likely to stay on track and less likely to skip out on workout sessions.

It's also a good idea to select someone with whom you connect, at least to some extent, on a personal level. Not all personalities mesh well together. Some people thrive off positive reinforcement, others fare better (7) when faced with constructive criticism.

To decide, whether a potential trainer will be a good fit, (8) ask questions about training style and fitness philosophy. Weight loss and physical fitness starts (9) with effective training methods, and a personal trainer can be the perfect person to get you on track toward a new and better you. [10]

1. Which choice makes the sentence most grammatically acceptable?
   (A) NO CHANGE
   (B) losing weight fast, some methods are
   (C) losing weight fast: some methods are
   (D) losing weight fast — some methods are

2. Which choice makes the sentence most grammatically acceptable?
   (F) NO CHANGE
   (G) profession, its critical
   (H) profession, its' critical
   (J) profession; it's critical

3. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE
(B) them
(C) a coach
(D) it

4. At this point, the author is considering adding the following statement:

This might include asking friends, family, or co-workers, or reading online reviews or testimonials.

Should the writer make this addition here?

(F) Yes, because it provides specific ways the reader may accomplish the prior suggestion offered in the passage.
(G) Yes, because it further explains the benefits of using a personal trainer.
(H) No, because it contains information that has been stated previously in the passage.
(J) No, because it does not emphasize how easy it is to find a personal trainer.

5. Which choice is least redundant in context?

(A) NO CHANGE
(B) clearly
(C) well and clear
(D) in a clear manner

6. Which transition word or phrase is most logical in context?

(F) NO CHANGE
(G) However,
(H) To illustrate,
(J) Delete the underlined portion and capitalize if.

7. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE
(B) reinforcement, others fare best
(C) reinforcement, but others fare better
(D) reinforcement, and, others fare best

8. Which choice makes the sentence most grammatically acceptable?

(F) NO CHANGE
(G) To decide whether a potential trainer will be a good fit,
(H) To decide whether, a potential trainer, will be a good fit
(J) To decide whether a potential trainer, will be a good fit,

9. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE
(B) begins
(C) starting

(D) start

10. Suppose the author's intent was to create an essay that highlights some of the best ways to lose weight. Would this essay successfully achieve that goal?

(F) Yes, because the essay shows that hiring a trainer is a helpful way to lose weight.

(G) Yes, because the essay highlights the importance of creating and sticking to a workout regimen.

(H) No, because the essay does not reveal that hiring a trainer may actually lead to weight gain from increased muscle mass.

(J) No, because the essay focuses on only one method for losing weight.

Passage 2

The Pitching Machine

Known as America's pastime, baseball means much more to many. Hitting baseballs is a major part of many a childhood, and using a pitching machine can be a great resource for ball players at any level to fine-tune their (11) skills behind the plate.

Among the more popular pitching machine models are circular-wheel machines and arm-action machines. If you're looking to buy one, look for a variety that closely reenacts (12) the pitches you'll experience during real game play. Machines that throw a variety of different pitches allow players to work on hitting while improving hand-eye coordination.

More advanced players who hit at more elevated levels (13) may favor a fast-pitch machine. Featuring many customizable options, a hitter can adjust the amount of time that passes between the release of each baseball (14) and set the machines at different heights.

Baseball is a wonderful sport, and these pitching machines can prove tremendously effective for players of all skill levels. [15] The device is a home run for players who want to maximize their skills at the plate.

11. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE

(B) they're

(C) there

(D) its

12. Which choice is clearest and most precise in context?

(F) NO CHANGE

(G) fakes

(H) assimilates

(J) replicates

13. Which choice is least redundant in context?

(A) NO CHANGE

(B) who hit at elevated levels

(C) hitting at elevated levels

(D) DELETE the underlined portion.

14. Which choice makes the sentence most grammatically acceptable?

(F) NO CHANGE

(G) adjustments may be made to the amount of time that passes between the release of each baseball and the machines' height settings.

(H) time between baseballs may be adjusted and heights changed.

(J) the machines may be adjusted to change their height and the amount of time that passes between the release of each baseball.

15. At this point at the end of the sentence, the writer is considering adding the following:

but mostly for younger hitters

Should the writer make this addition?

(A) No, because it contradicts the author's point that pitching machines are equally effective for players of all skill levels.

(B) No, because professional players likely benefit more from pitching machines than do little league players.

(C) Yes, because it furthers the author's argument that young players benefit more from pitching machines than older ones.

(D) Yes, because it builds upon the point made in the previous paragraph.

Passage 3

Teddy Roosevelt: A Political Maverick

No figure better represents the Progressive Era than Theodore "Teddy" Roosevelt. Born into a wealthy New York family, Roosevelt has risen[16] to national prominence[17] rather quickly. Early in his career, Roosevelt served as commissioner of the New York City Police Department before becoming the Assistant Secretary of the Navy. In the Spanish-American War, Roosevelt gained notoriety for leading his military volunteer unit, the "Rough Riders" to victory in the Battle of San Juan Hill[18] in Cuba. In 1900, Roosevelt became Republican William McKinley's vice-presidential candidate. McKinley was assassinated in 1901. [19] At age 42, Roosevelt became the youngest to assume the presidency of the United States.

"TR," as he came to be known, exuded an active, vibrant personality. Roosevelt was intelligent, well read, and knowledgeable about the environment, history, and naval strategy. He demonstrated his love for sports and competition by participating in boxing, being a big-game hunter[20], and other outdoor pursuits. His dynamic lifestyle carried over into his presidency, which lasted from 1901 to 1909, and he became one of the most active presidents in the history of the United States. Among the topics he tackled were trusts, railroads, safety in the food industry, and the environment.

Roosevelt demonstrated his distaste for trusts during the coal strike crisis of 1902. No fewer than 50,000 coal miners went on strike, demanding better working conditions and higher pay. Roosevelt intervened, inviting the union representatives and mine owners to the White House to try to find a solution. Therefore,[21] the owners refused to speak with the union representatives. Roosevelt was infuriated by this rebuff, and he threatened to send federal troops to operate the mines. At the urging of J.P. Morgan (the renowned financier who formed the U.S. Steel Corporation), the owners backed down and gave the miners shorter workdays (9 hours) and better wages (10% wage increases). [22]

Railroad reform was another of Roosevelt's important contributions to the progressive cause. During[23] the beginning of the 20th century, railroad companies controlled the prices of their services. Roosevelt believed that this system gave private companies too much power, which ultimately hurt consumers. For example,[24] he supported the Hepburn Railroad Act, which gave the Interstate Commerce Commission the power to regulate the prices of railroad rates and audit railroad company's[25] financial records. Congress passed the Hepburn Railroad Act, and Roosevelt signed it into law in 1906. Roosevelt proved that he would not hesitate to challenge the powers and abuses of big business.

16. Which choice makes the sentence most grammatically acceptable?
    (F) NO CHANGE
    (G) rises
    (H) rose
    (J) has rose

17. Which choice is clearest and most precise in context?
    (A) NO CHANGE
    (B) infamy
    (C) obscurity
    (D) anonymity

18. Which choice makes the sentence most grammatically acceptable?
    (F) NO CHANGE
    (G) the "Rough Riders," to victory in the Battle of San Juan Hill
    (H) the "Rough Riders" to victory, in the Battle of San Juan Hill
    (J) the "Rough Riders," to victory in the Battle of San Juan Hill,

19. The author is considering inserting a few lines about what led to McKinley's assassination and who was responsible. Would that insertion be appropriate here?
    (A) Yes, because it would clarify how Roosevelt came to assume the presidency.
    (B) Yes, because it contains important clarifying information about McKinley.
    (C) No, because the focus of the passage is Roosevelt, not McKinley.
    (D) No, because this information should appear earlier in the passage.

20. Which choice makes the sentence most grammatically acceptable?
    (F) NO CHANGE
    (G) was a big-game hunter

(H) engaging in big-game hunting
(J) big-game hunting

21. Which transition word or phrase is most logical in context?
(A) NO CHANGE
(B) However,
(C) Finally,
(D) As a result,

22. The author is considering deleting the preceding sentence. Without the sentence, the paragraph would primarily lose:
(F) details that summarize one of Roosevelt's specific accomplishments.
(G) interesting but irrelevant information.
(H) foreshadowing of an event detailed in the next paragraph.
(J) general observations about Roosevelt's achievements.

23. Which choice is clearest and most precise in context?
(A) NO CHANGE
(B) At
(C) After
(D) Through

24. Which transition word or phrase is most logical in context?
(F) NO CHANGE
(G) Nevertheless,
(H) On the contrary,
(J) Thus,

25. Which choice makes the sentence most grammatically acceptable?
(A) NO CHANGE
(B) companies
(C) companies'
(D) companys'

Passage 4

Remote Computer Repair

[1]

In today's fast-paced world, the multifaceted virtues of the internet enable our fingers to access virtually anything simply. While this facility has eased a good bit of how we do things in the modern working world, what it has failed to (26) accomplish, is the prevention of a crisis when a computer suddenly crashes. So, (27) remote computer repair provides a great resource for anyone that (28) conducts a business in front of a computer screen.

[2]

If your computer experiences crashes, is prone to viruses, needs a tune-up, or requires hardware or software installation, remote computer repair can get you up and running again quickly. Rather than wait days or even weeks without your (29) machine, consider having a trained professional perform repairs remotely so that you can avoid lost time or wages as a result from (30) your damaged equipment.

[3]

Remote computer repair is done by a professional logging into your computer using a highly secure Internet connection. Rather (31) than paying you an actual visit. It can be a great option for people who cannot be without they're (32) computer for long or for those who cannot get to a repair shop. Remote repair can get your laptop or PC in working order again in a matter of hours or even minutes, depending on the severity of the problem. [34] (33)

[4]

Whether you need to remove viruses, fix a frozen screen, or install a home or business office network, a remote computer repair person should be your first call to get your machine up and running. [35]

26. Which choice makes the sentence most grammatically acceptable?

(F) NO CHANGE

(G) what, it has failed to accomplish

(H) what it has failed, to accomplish

(J) what it has failed to accomplish

27. Which transition word or phrase is most logical in context?
    (A) NO CHANGE
    (B) However,
    (C) On the other hand,
    (D) For instance,

28. Which choice makes the sentence most grammatically acceptable?
    (F) NO CHANGE
    (G) anyone, which conducts
    (H) anyone who conducts
    (J) anyone, who conducts

29. Which choice makes the sentence most grammatically acceptable?
    (A) NO CHANGE
    (B) wait days, or even weeks without your machine,
    (C) wait days or, even weeks, without your machine
    (D) wait days or even weeks, without your machine,

30. Which choice is clearest and most precise in context?
    (F) NO CHANGE
    (G) with
    (H) as
    (J) of

31. Which choice makes the sentence most grammatically acceptable?
    (A) NO CHANGE
    (B) connection rather
    (C) connection, and rather
    (D) connection; rather

32. Which choice makes the sentence most grammatically acceptable?
    (F) NO CHANGE
    (G) his or her
    (H) their
    (J) there

33. The author of the passage is considering deleting the underlined phrase from the sentence and ending it with a period. If the author were to delete this content, the sentence would primarily lose:
    (A) a minor detail about remote repair.
    (B) an example of the type of repair that can be accomplished remotely.
    (C) an explanation for a time difference.

(D) a foreshadowing of the topic in the following paragraph.

34. Which of the following sentences most effectively concludes this paragraph?

(F) More severe issues take longer than simple ones.

(G) Remote computer repair can prove tremendously helpful for those who cannot be without their computers.

(H) Calling a remote technician will also save you traveling time to and from the repair shop.

(J) When computer issues arrive, your first call should be to a remote computer repair specialist.

35. To make this passage a coherent whole, Paragraph 4 should be:

(A) placed where it is now.

(B) placed before Paragraph 1.

(C) placed after Paragraph 2.

(D) deleted entirely.

Passage 5

Competition for Niches

[1]

Competing for a limited number of resources, such as nutrients, energy, and territory, results in the evolution of an organism's characteristics and behaviors to compensate. [2] Darwin's theory states that competition for resources are (36) what drives evolution, so most characteristics and behaviors have evolved in order to improve its (37) ability to compete and survive in the ecosystem. [3] Over the generations, each species in the ecosystem will settle into its own way of securing a living. [4] A niche includes the species' diet, its territory, its behaviors, its roles in the nutrient cycles, and anything else that helps define its lifestyle. [5] Another way to describe this is to say that each species establishes its own "niche" in the ecosystem. (38)

[2]

Every niche has two types of components: abiotic and biotic. "Abiotic" means nonliving. This category includes elements such as an area's physical terrain, average yearly rainfall, and average daily temperature. "Biotic" means living; this part of the niche includes all of the other species in the community — the predators, prey, parasites, competitors, and so on — with whom the particular species is likely to interact during its life.

Whenever the niche of a species overlap with another, such as when two species occupy the same space or eat the same food, that species is automatically in competition with the other. Competition in the wild can take many forms and only occasionally involves direct combat. A species can win a competition by being faster, more efficient, smarter, or more colorful. In the end, only three possible results of a competition exist: win, lose, or compromise. One species may win the competition and take over that part of the niche, it may lose and be forced to retreat from that part, or two species may find a way to divide that part of the niche so that they can coexist peacefully.

In addition to interspecific competition, competition between individuals of the same species, called *intraspecific competition*, also occurs. This competition can lead to the development of unusual qualities, such as, vibrant coloring. Sometimes only the prettiest, the smelliest, or the loudest are able to win the competition and pass on their lovely, stinky, or noisy genes.

36. Which choice makes the sentence most grammatically acceptable?

(F) NO CHANGE
(G) is
(H) have been
(J) were

37. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE
(B) a life form's
(C) it's
(D) their

38. For the sake of logic and coherence in Paragraph 1, Sentence 5 should be placed:

(F) where it is now.
(G) before Sentence 2.

(H) before Sentence 3.
(J) before Sentence 4.

39. Which of the following substitutes for the underlined portion would NOT be grammatically acceptable?
(A) components, and they are abiotic and biotic
(B) components that are abiotic and biotic
(C) components, abiotic and biotic
(D) components — abiotic and biotic

40. Which choice makes the sentence most grammatically acceptable?
(F) NO CHANGE
(G) through whom
(H) with which
(J) that

41. Which choice is clearest and most precise in context?
(A) NO CHANGE
(B) Although
(C) Whether
(D) Often,

42. Which choice makes the sentence most grammatically acceptable?
(F) NO CHANGE
(G) overlaps,
(H) are overlapping,
(J) was overlapping,

43. Which transition word or phrase is most logical in context?
(A) NO CHANGE
(B) For example,
(C) On the other hand,
(D) Finally,

44. Which of the following additions here provides the best conclusion for this paragraph?
(F) Otherwise, the species are more likely to engage in direct combat.
(G) Competition between species is inevitable.
(H) Those that fit the niche best are most likely to survive within it.
(J) Each species generally occupies its exclusive niche.

45. Which choice makes the sentence most grammatically acceptable?
(A) NO CHANGE
(B) qualities such as:

(C) qualities; such as

(D) qualities such as

Passage 6

The Evolution of Greek Tragedy

Greek drama emerged in the fifth century B.C. from public performances of narrative lyrics. Three playwrights — Aeschylus, Sophocles, and Euripides — dominated the Athenian stage. [46] Actors, wearing masks and platform shoes, performed for large audiences, relying primarily on dialogue rather then action to tell there stories.[47] These tragedies typically depicted a hero's downfall, often caused by a fatal character flaw. [48]

A prime example is Sophocles' *Oedipus Tyrannus*, where Oedipus, despite his efforts, discovers he just can't get away from[49] the prophecy that he would kill his father. Accepting his fate, he leaves the chorus to mourn the cruelty and inevitability of destiny. In contrast, Euripides a contemporary of[50] Sophocles, portrayed characters with greater emotional depth, emphasizing human emotions over fate-driven tragedy. His play *Alcestis* highlights friendship's power to alter fate, diverging from the traditional tragic flaw narrative.51. At this point in the paragraph, the author is considering adding this sentence:

46. Greek dramatists created great works in other centuries, too.

Would this addition be appropriate given the primary topic of the paragraph?

(F) Yes, because the paragraph is about Greek dramatists.

(G) Yes, because the sentence provides additional information about Greek dramatists that improves the readers understanding of how influential Greek drama was in early times.

(H) No, because the paragraph is about dramatists from all cultures and the sentence only mentions Greek dramatists.

(J) No, because the paragraph is specifically about fifth-century Greek drama.

47. Which choice makes the sentence most grammatically acceptable?

(A) NO CHANGE

(B) than action to tell there stories.

(C) than action to tell their stories.

(D) then action to tell their stories.

48. Given that all choices are accurate, which one provides the best transition from this paragraph to the following paragraph?

(F) The plays emphasized humanity's inability to escape fate, with any attempt to change destiny leading to greater suffering.

(G) Explorations of fate and personal struggle are themes that appear in many well-known plays.

(H) These plays were widely performed, and many people attended them.

(J) This is why Sophocles was an important playwright and why his plays are still studied in high school and college classrooms across the globe.

49. Which choice most effectively maintains the tone of the essay?

(A) NO CHANGE

(B) he cannot escape the prophecy

(C) it's an epic fail to try to outrun the prophecy

(D) he's stuck with the prophecy

50. Which choice makes the sentence most grammatically acceptable?

(F) NO CHANGE

(G) contrast Euripides, a contemporary of Sophocles

(H) contrast, Euripides — a contemporary of Sophocles —

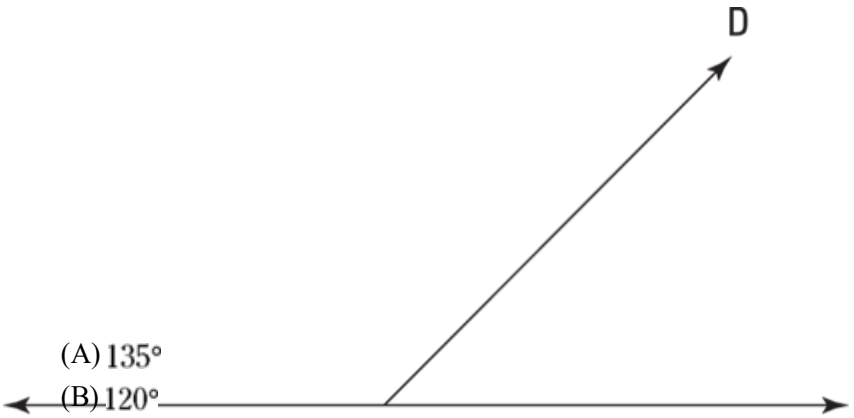
(J) contrast, Euripides, a contemporary of Sophocles;

Mathematics Test

1. What is the value of $y \times 2^x$ if $x = 3$ and $y = 2$?
   (A) 8
   (B) 16
   (C) 12
   (D) 64

2. The first four terms of a geometric sequence are .75, 1.5, 3, and 6. What is the fifth term?
   (F) 12
   (G) 9
   (H) 18
   (J) 11.25

3. In the following figure, *A*, *B*, and *C* are collinear. The measure of $\angle ABD$ is three times that of $\angle DBC$. What is the measure of $\angle ABD$?



   (A) 135°
   (B) 120°
   (C) 67.5°
   (D) 60°

4. Which of the following is equivalent to $\frac{\frac{3}{3}}{8}$?

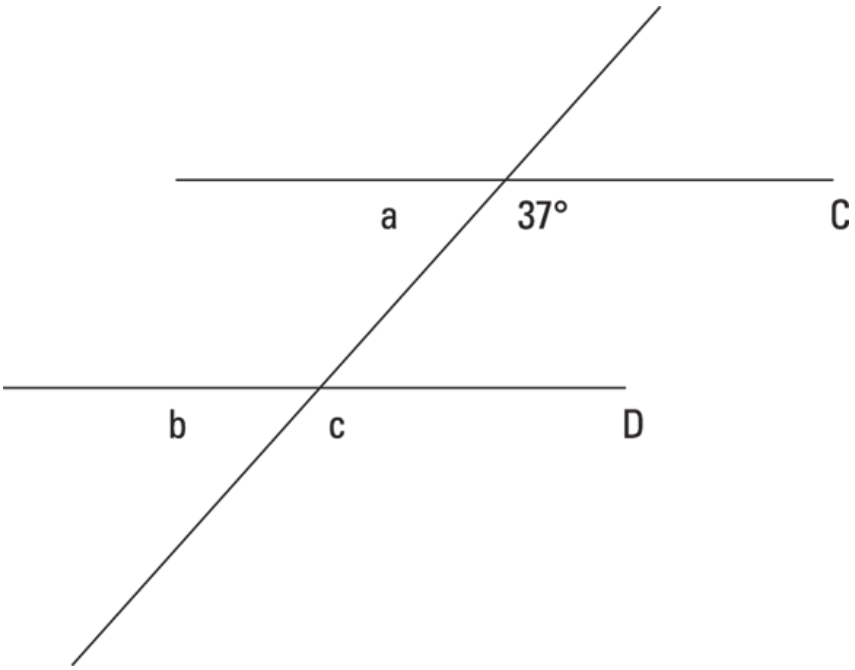
(F) 3

(G) 8

(H) $\frac{9}{8}$

(J) $\frac{1}{8}$

5. What is the measure of angle b in the following figure where lines C and D are parallel?



(A) $37°$

(B) $53°$

(C) $127°$

(D) $143°$

6. Ross has 2 black socks and 2 white socks lying in his drawer. If he mindlessly selects two socks from the drawer, what is the chance he will select the black pair?

(F) $\frac{1}{6}$

(G) $\frac{1}{4}$

(H) $\frac{1}{2}$

(J) $\frac{5}{6}$

7. A triangular ramp from the ground to the bed of a truck that stands 6 feet off the ground has a base of 8 feet. How long in feet is the length of the bottom of the ramp?

(A) 5 feet

(B) 5.29 feet

(C) 8 feet
(D) 10 feet

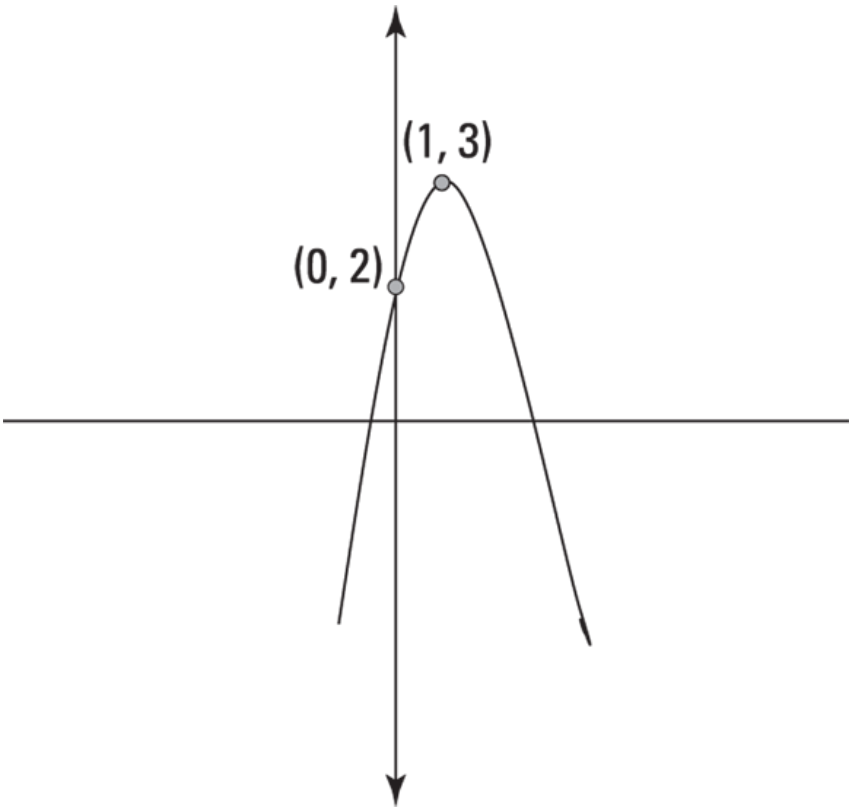
8. At what point does $7x + 4y = 28$ intersect the *y*-axis in the standard (*x, y*) coordinate plane?
(F) (4, 0)
(G) (7, 0)
(H) (0, 4)
(J) (0, 7)

9. Simplify $\left(\frac{3x}{y}\right)\left(\frac{x^3y^2}{6}\right)$.
(A) $\frac{x^4y}{2}$
(B) $\frac{x^4y^3}{2}$
(C) $\frac{x^2y^3}{2}$
(D) $\frac{3x + x^3y^2}{y + 6}$

10. What is the value of *y* in the following system of equations?
$$2x + 3y = 6$$
$$x - y = 8$$
(F) 6
(G) 2
(H) 0
(J) –2

11. Tickets to a movie cost $8 for adults and $5 for children. If 40 tickets are sold for a total of $251, how many adult tickets were sold?
(A) 15
(B) 17
(C) 20
(D) 23

12. Which of the following functions is represented on the standard (*x, y*) coordinate plane shown here?



(E) $y = -(x+3)^2 + 1$

(F) $y = -(x+1)^2 + 3$

(G) $y = (x-1)^2 + 3$

(H) $y = -(x-1)^2 + 3$

13. Which of the following values for x makes $\log_6 9 + \log_6 x = 2$?

(A) $\frac{1}{3}$

(B) $1\frac{1}{3}$

(C) 27

(D) 4

14. What is the volume in cm^3 of a circular cylindrical soda can whose diameter is 10 cm and height is 15 cm?

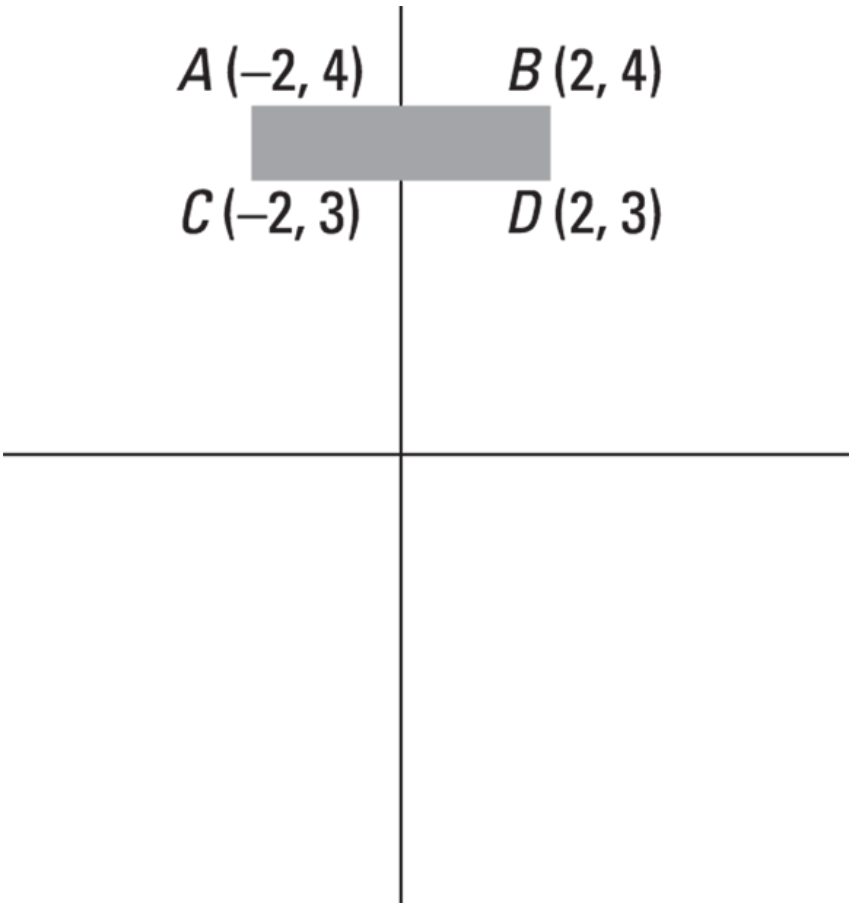
(F) 10π

(G) 150π

(H) 375π

(J) 625π

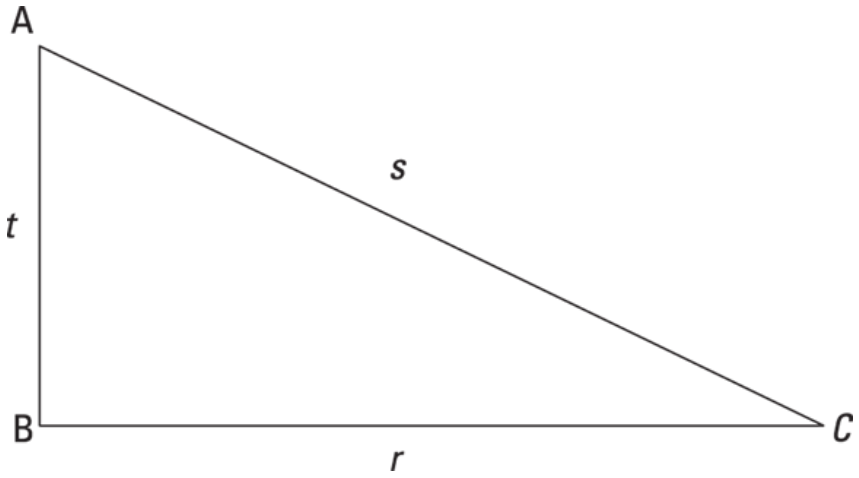
15. If in the standard (x, y) coordinate plane the quadrilateral ABCD shown here was reflected over the line $y = 2$ to form quadrilateral $A_1B_1C_1D_1$, at what pair of coordinates would point A_1 lie?



(A) (–2, 0)
(B) (6, 4)
(C) (2, 4)
(D) (–2, –4)

16. Klaus decided to give 20% of the money he got for his birthday to his favorite charity and put the rest in the bank. If he put $280 in the bank, how much money did he receive for his birthday?
(A) $56
(B) $70
(C) $350
(D) $336

17. In the right triangle shown here, what is cos *C*?



(A) $\frac{t}{r}$

(B) $\frac{s}{r}$

(C) $\frac{t}{s}$

(D) $\frac{r}{s}$

18. For all pairs of real numbers *x and y* where $x = 3y + 8$, what does *y* equal?

(F) $\frac{x}{3} - 8$

(G) $x - \frac{8}{3}$

(H) $3y + 8$

(J) $\frac{x - 8}{3}$

19. On the following number line, the distance between *A* and *D* is 28 units. The distance between *A* and *C* is 15 units. The distance between *B* and *D* is 18 units. What is the distance in units between *B* and *C*?

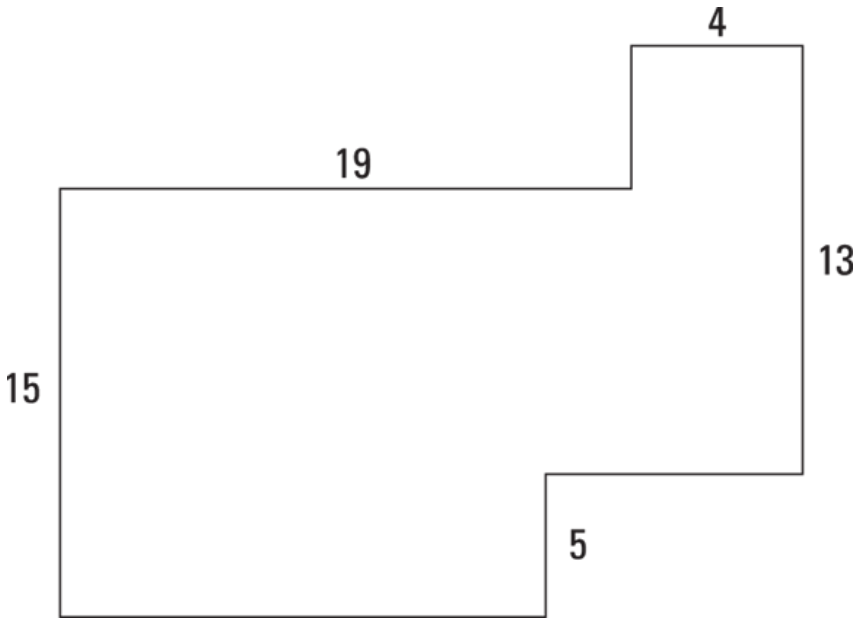
(A) 5

(B) 6

(C) 8

(D) 10

20. What is the perimeter of the following polygon whose angles each measure $90°$?



(F) 56
(G) 74
(H) 77
(I) 82

21. What is the circumference of a circle whose area is 16π?

(A) 8π
(B) 4
(C) 4π
(D) 8

22. The following stem-and-leaf plot shows all of the test scores Cydney received in her algebra course this year. Each test score reflects the number of points received out of a possible 100 points. What was Cydney's median math test score for the year?

Scores that Cydney Received on All Math Tests this Year	
7	899
8	23455677999
9	14669

(F) 86
(G) 87
(H) 88
(I) 89

23. If $f(x) = x - 3$, what is $f(2x + 2)$?

(A) $-x - 2$

(B) $3x - 1$
(C) $2x - 1$
(D) $3x - 4$

24. A car's starting velocity is 10 meters per second as it enters a ramp to the freeway. The physics equation for velocity is $v = at + v_0$ where t stands for time and v_0 is the initial velocity. What is the car's acceleration (a) in meters per square second if it takes 10 seconds to reach 30 meters per second and it accelerates uniformly?

(F) 3
(G) 13
(H) 7
(J) 2

25. A license plate in the fictional state of Greenwood has two digits followed by two letters. How many different license plate combinations can Greenwood create if digits can be repeated but letters cannot?

(A) 60,840
(B) 65,000
(C) 67,600
(D) 71

26. On a recent math test, Caroline scored 99, Stephanie scored 97, Julie scored 92, and Amanda scored 88. Courtney was the only other person who took the test, and the average of the five scores was 91. What was Courtney's score?

(F) 79
(G) 88
(H) 91
(J) 94

27. The floor of a 14-foot-wide rectangular room has an area of 672 square feet. What is the length, in feet, of its diagonal?

(A) 28
(B) 45
(C) 48
(D) 50

28. For what values of x does $x^4 - 5x^2 + 4 = 0$?

(F) 1 and 4 only
(G) –1 and –2 only
(H) 1, 4, –1, and –4 only
(J) 1, 2, –1, and –2 only

29. Sam has 360 cubic centimeters of peanut butter to make nine sandwiches for her softball team. The bread measures 10 centimeters by 10 centimeters. If she spreads the peanut butter evenly over

one piece of bread for each sandwich, how thick will the peanut butter layer measure on each sandwich?

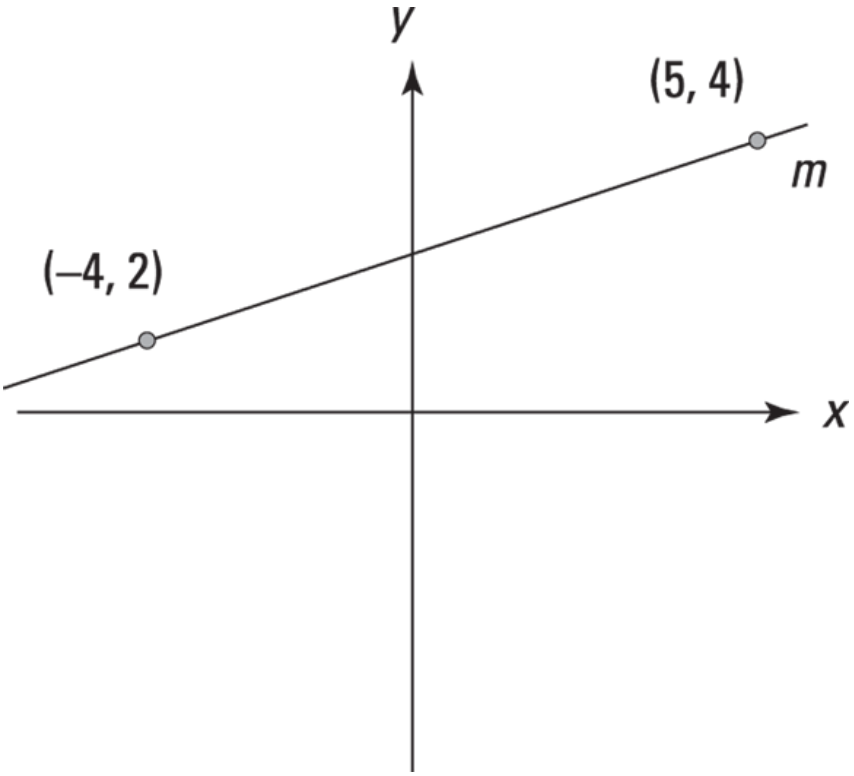
(A) 0.2 cm

(B) 0.4 cm

(C) 3.6 cm

(D) 4 cm

30. What would be the slope of any line perpendicular to line *m* in the following figure?



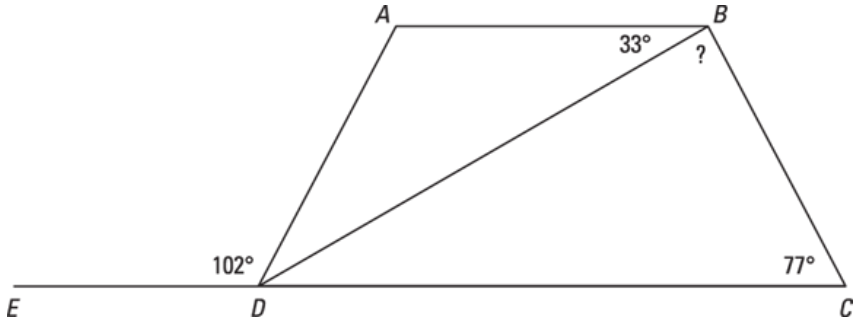
(F) $\frac{9}{2}$

(G) $\frac{2}{9}$

(H) $-\frac{2}{9}$

(J) $-\frac{9}{2}$

31. What is the measure in degrees of $\angle DBC$ in the following diagram if polygon ABCD is a trapezoid?



(A) 33
(B) 45
(C) 70
(D) 102

32. There is a straight 65-mile road between Denver and Boulder. If Jackson leaves Boulder at 3:15 PM traveling 40 mph and Emily leaves Denver at the same time traveling 60 mph, how many miles from Denver will the two pass each other?

(F) 20
(G) 26
(H) 32.5
(J) 39

33. The 337 cars on the lot at Madi's Auto Dealership come in a variety of colors. About $\frac{2}{3}$ of the cars on the lot are blue. Of those, about $\frac{1}{4}$ are royal blue and $\frac{3}{4}$ are navy blue. About how many cars are navy blue?

(A) 56
(B) 169
(C) 225
(D) 253

34. For all $x \neq 0$ and $y \neq 0$, $\frac{(3x^3y^2)^2}{3xy^{-3}} =$?

(F) x^5y^7
(G) $3x^5y^7$
(H) $3x^5y$
(J) $3x^4y^7$

35. What is the largest possible sum of two integers that have a product that ranges between –8 and 0 exclusive?

(A) 4
(B) 5
(C) 6

(D) 8

36. Austin wants to open up a barbershop because there seems to be an insufficient number of them in the area. First, however, he needs to determine whether he will be running a profitable business. He has found a space to rent for $600 per month, and his monthly supplies will cost about $200. If he has to pay 10 barbers $12 per hour to cut hair, the barbers are working 120 hours per month, and he can sell 1,200 haircuts for $15 apiece, will his business make a profit after the first month?

(F) No, his business will lose $4,400 in the first month.

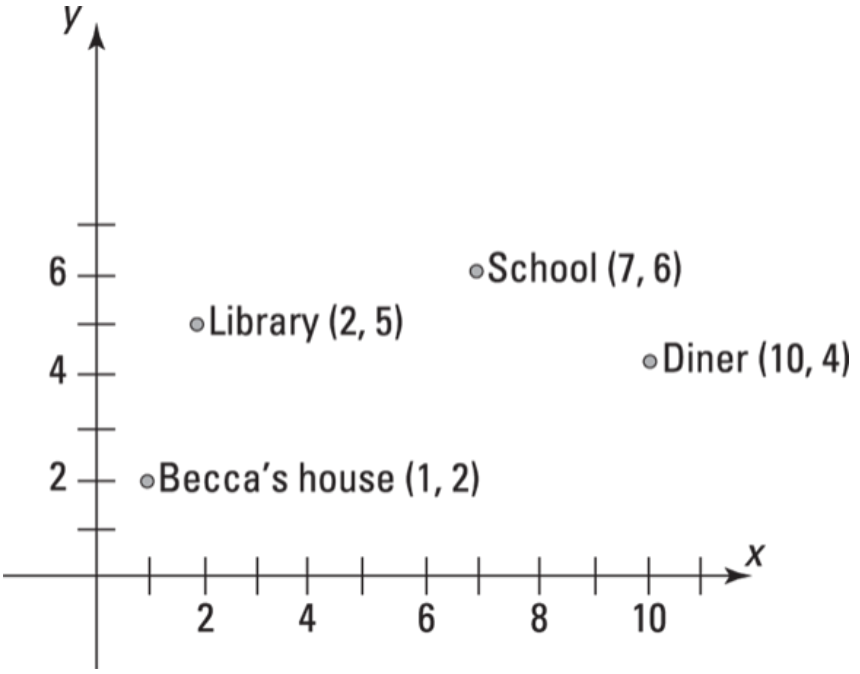
(G) No, his business will lose $2,800 in the first month.

(H) Yes, his business will make a profit of $2,800 in the first month.

(J) Yes, his business will make a profit of $4,400 in the first month.

Use the following information to answer questions 37–39.

The following figure maps in the standard (*x*, *y*) coordinate plane the locations that Becca frequents most often in her small town of Larkspur. Most weekday mornings, Becca walks from her house to school. After school, she stops at the library to study before she walks to the diner to begin her 3-hour shift as a server.



37. What is the slope of the straight line that marks the shortest distance Becca walks from the library to the diner?

(A) –8

(B) $-\frac{1}{8}$

(C) $\frac{1}{8}$

(D) 8

38. Which of the following represents the equation of a circle that is tangent to the *x*-axis and whose center is the point that marks Becca's house?

(F) $(x-2)^2+(y-1)^2=1$

(G) $(x+2)^2+(y+1)^2=4$

(H) $(x-1)^2+(y-2)^2=4$

(J) $(x-1)^2+(y-2)^2=2$

39. Which of the following is closest to the shortest distance, to the nearest mile, that Becca could walk between her house and the school if each unit in the coordinate system is equivalent to 2 miles?

(A) 5

(B) 11

(C) 14

(D) 17

40. $\frac{2}{5}$ of a number is equal to $\frac{1}{4}$ of 21 more than that number. What is the number?

(F) 28

(G) 35

(H) 42

(J) 140

41. If $y=7x-h$ and $x=h+7$, then what is the value of *y* expressed in terms of *x*?

(A) $y=7xh+49x-h$

(B) $y=6x-7$

(C) $y+h=7x$

(D) $y=6x+7$

42. A circle whose radius is 7 cm is circumscribed inside a square. What is the area of the part of the square that is not taken up by the circle?

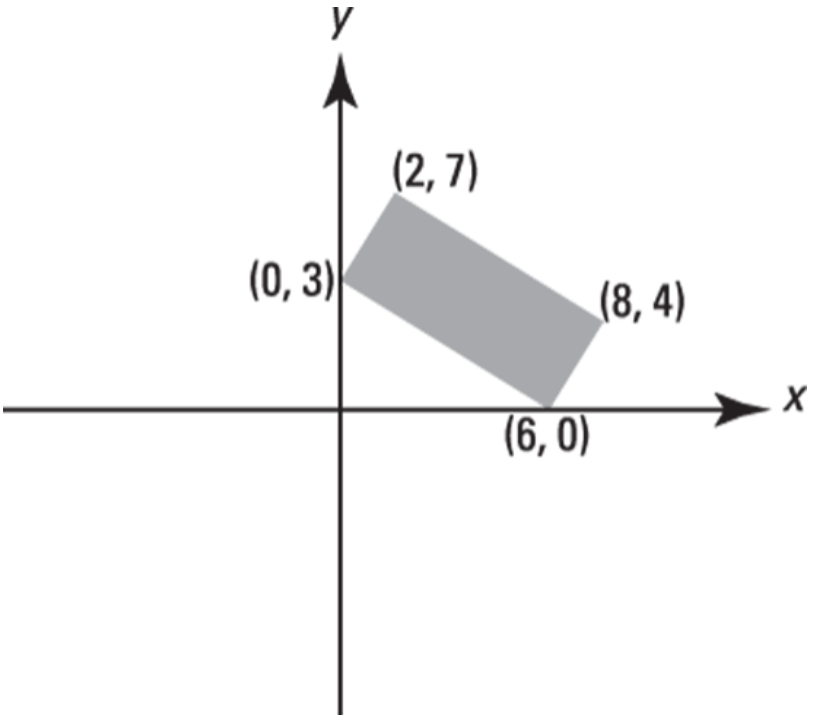
(F) 49π

(G) $49-14\pi$

(H) $196-14\pi$

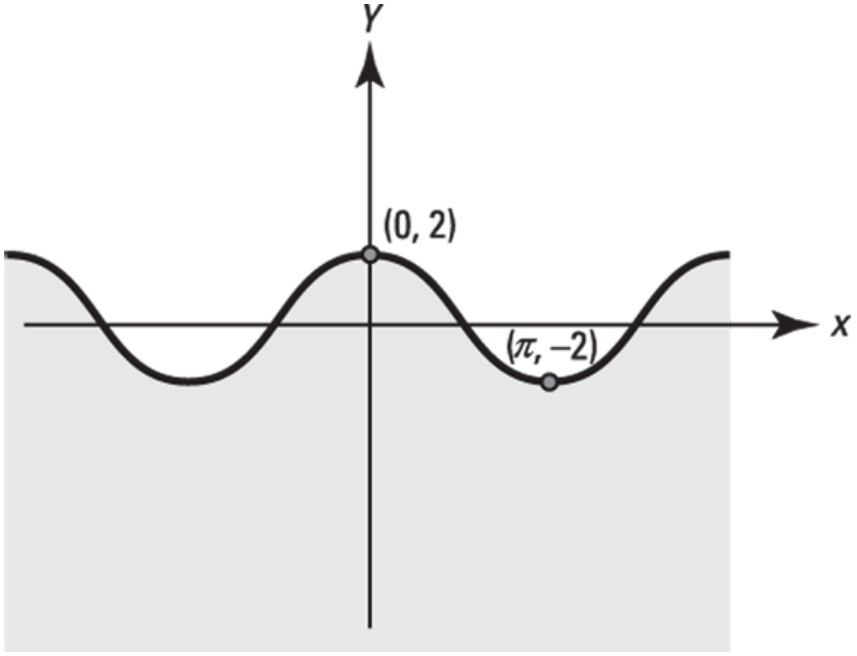
(J) $196-49\pi$

43. What is the area in square units of the following rectangle?

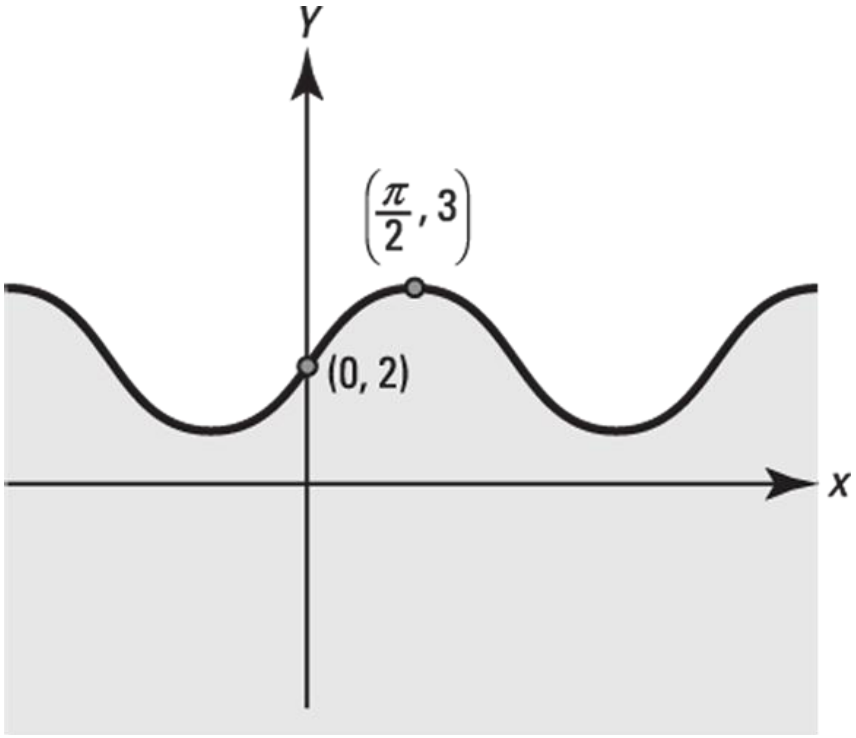


(F) 11.18
(G) 24
(H) 30
(J) 56.33

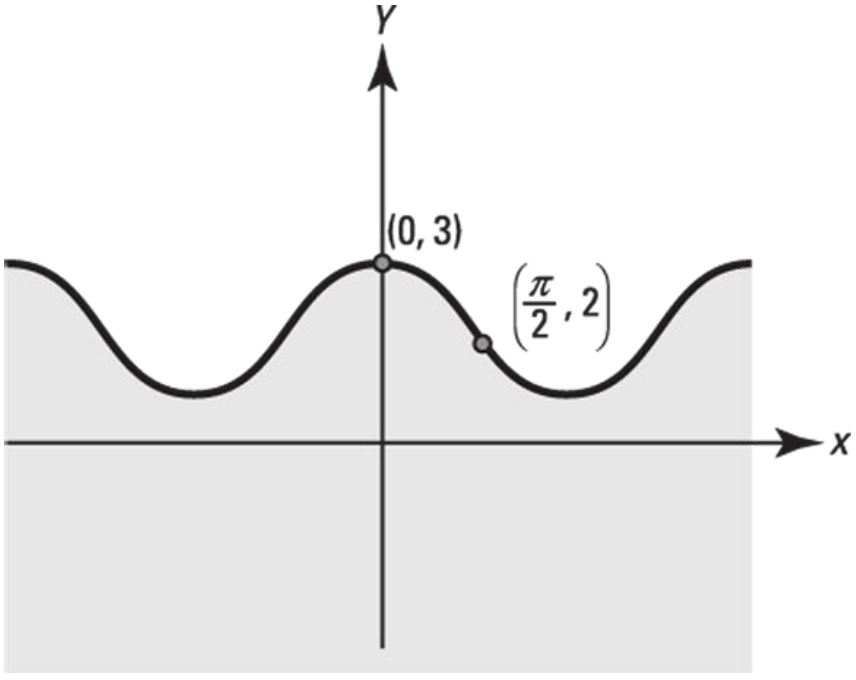
44. Which one of the following graphs best represents the inequality $y \leq \sin(x) + 2$?

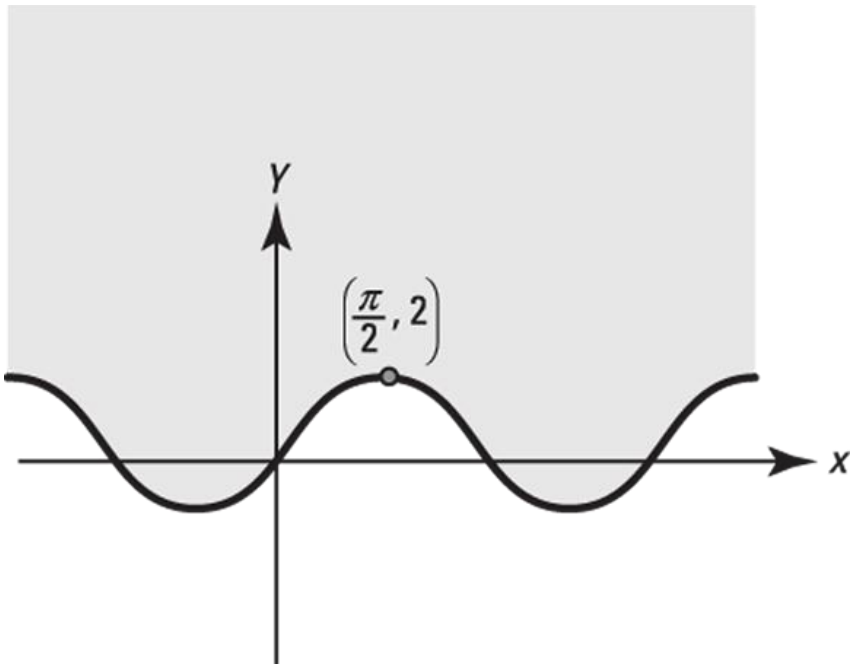
(F)


(G)



(H)





(J)

45. Jordyn has $600 in a savings account that earns 5% in interest compounded biannually, which means that she earns 5% of her existing money twice per year. The money she makes through interest is then added to the amount of money she already has in her savings account. After a year and a half, Jordyn moves $210 to a checking account that doesn't earn interest to buy a camera. How much money to the nearest cent does Jordyn have in her savings account after two years?

(A) $484.58

(B) $504

(C) $508.80

(D) $720.00

Reading Test

TIME: 40 minutes for 36 questions

DIRECTIONS: Each of the four passages in this section is followed by ten questions. Answer each question based on what is stated or implied in the passage and shade the corresponding oval on your answer sheet.

Passage I — Literary Narrative

This passage is adapted from the novel, *Song of the Lark,* by Willa Sibert Cather.

Line

"And it was Summer, beautiful Summer!" Those were the words of Thea's favorite fairy tale, and she thought of them as she ran one Saturday morning in May, her music book under her arm. She was going to the Kohlers' to take her lesson, but she was in no hurry.

It was in the summer that one really lived. Then all the little overcrowded houses were opened wide, and the wind blew through them with sweet, earthy smells of garden-planting. People were out painting their fences. The cottonwood trees were a-flicker with sticky, yellow little leaves, and the feathery tamarisks were in pink bud. With the warm weather came freedom for everybody. The very old people, whom one had not seen all winter, came out and sunned themselves in the yard. The double windows were taken off the houses, the tormenting flannels in which children had been encased all winter were put away in boxes, and the youngsters felt a pleasure in the cool cotton things next their skin.

Thea had to walk more than a mile to reach the Kohlers' house. On a little rise of ground that faced the open sandy plain, was the Kohlers' house, where Professor Wunsch lived. Fritz Kohler was the town tailor, one of the first settlers. He had moved there, built a little house and made a garden, when Moonstone was first marked down on the map. He had three sons, but they now worked on the railroad and were stationed in distant cities. One of them had gone to work for the Santa Fe, and lived in New Mexico.

Mrs. Kohler seldom crossed the ravine and went into the town except at Christmastime, when she had to buy presents to send to her old friends in Freeport, Illinois. As she did not go to church,

she did not possess such a thing as a hat. Year after year she wore the same red hood in winter and a black sunbonnet in summer. She made her own dresses; the skirts came barely to her shoe-tops, and were gathered as full as they could possibly be to the waistband. She preferred men's shoes, and usually wore the cast-offs of one of her sons. She had never learned much English, and her plants and shrubs were her companions. She lived for her men and her garden. Beside that sand gulch, she had tried to reproduce a bit of her own village in the Rhine Valley. She hid herself behind the growth she had fostered, lived under the shade of what she had planted and watered and pruned. Shade, shade; that was what she was always planning and making. Behind the high tamarisk hedge, her garden was a jungle of verdure in summer. Above the cherry trees and peach trees stood the windmill, which kept all this verdure alive. Outside, the sagebrush grew up to the very edge of the garden.

Everyone in Moonstone was astonished when the Kohlers took in the wandering music-teacher. In seventeen years old Fritz had never had a crony, except the harness-maker and Spanish Johnny. This Wunsch came from God knew where, and played in the dance orchestra, tuned pianos, and gave lessons. When Mrs. Kohler rescued him, he was sleeping in a dirty, unfurnished room over one of the saloons, and he had only two shirts in the world. Once he was under her roof, the old woman went at him as she did at her garden. She sewed and washed and mended, and made him so clean and respectable that he was able to get a large class of pupils and rent a piano. As soon as he had money, he sent to the Narrow Gauge lodging-house, in Denver, for a trunkful of music which had been held there for unpaid board. With tears in his eyes the old man — he was not over fifty, but sadly battered — told Mrs. Kohler that he asked nothing better of God than to end his days with her, and to be buried in the garden, under her linden trees. They were not American basswood, but the European linden, which has honey-colored blooms in summer, with a fragrance that surpasses all trees and flowers and drives young people wild with joy.

Thea was reflecting as she walked along that had it not been for Professor Wunsch she might have lived on for years without ever knowing the Kohlers, without ever seeing their garden or the inside of their house.

Professor Wunsch went to the houses of his other pupils to give them their lessons, but one morning he told Mrs. Kronborg that Thea had talent. Mrs. Kronborg was a strange woman. That word "talent," which no one else in Moonstone would have understood, she comprehended perfectly. To any other woman, it would have meant that a child must have her hair curled every day and must play in public. Mrs. Kronborg knew it meant that Thea must practice four hours a day. A child with talent must be kept at the piano, just as a child with measles must be kept under the blankets.

1. Which of the following examples best parallels the analogy that Mrs. Kronborg made in the final paragraph?

(A) A student with good writing skills must work harder on math.

(B) A young girl with beauty must be kept under close watch.

(C) A person with outdoor allergies must be kept indoors.

(D) A child with learning differences may benefit from tutoring.

2. The author associates all of the following with the onset of summer EXCEPT:
   (F) seeing new neighbors
   (G) the blossoming of cottonwood trees
   (H) home dwellers painting their fences
   (J) children wearing cool clothing instead of warm

3. The use of the word crony at line 58 most likely means:
   (A) elder.
   (B) buddy.
   (C) enemy.
   (D) teacher.

4. When the author says, "the old woman went at him like she did her garden" (lines 65–66), she most nearly means Mrs. Kohler:
   (F) determined to rid Professor Wunsch of his less desirable qualities.
   (G) tried in vain to improve his appearance.
   (H) spruced him up with care and attention.
   (J) tried to mold him into her idea of perfection.

5. The author makes all of the following assertions regarding Mrs. Kohler's personal style, EXCEPT:
   (A) she wore a black hood in the wintertime.
   (B) she wore a black sunbonnet in the summertime.
   (C) Mrs. Kohler preferred men's shoes over women's.
   (D) Mrs. Kohler made her own dresses.

6. The best way to describe the way Professor Wunsch feels toward Mrs. Kohler is:
   (F) indifferent.
   (G) amorous.
   (H) grateful.
   (J) bitter.

7. Mrs. Kohler's garden is best described as a:
   (A) haven where she hid, planned, and found purpose.
   (B) reminder of her homeland, filled with hedges, fruit trees, and sage-brush.
   (C) barren sand gulch that she fled to when she was lonely.
   (D) verdant paradise fed by Moonstone's frequent rainfall.

8. The author makes which of the following assertions about Mr. Kohler?
   (A) He played in the dance orchestra.
   (B) He had only three friends.
   (C) He had a son who lived in Santa Fe.
   (D) He was one of the first men to live in Moonstone.

9. The author would most likely say that Thea differed from other children in that she:

(A) had few friends and attended few social gatherings.

(B) studied music with Professor Wunsch.

(C) was particularly fond of fairy tales.

(D) was musically gifted.

Passage II — Social Science

Passage A

This passage is adapted from *Posttraumatic Stress Disorder: Issues and Controversies*, edited by Gerald M. Rosen (2004).

Line

Controversy has haunted the diagnosis of post-traumatic stress disorder (PTSD) ever since its first appearance in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (05) (*DSM-III*). At the outset, psychiatrists opposed to the inclusion of the diagnosis in the *DSM-III* argued that the problems of trauma-exposed people were already covered by combinations of existing diagnoses.

(10) Ratifying PTSD would merely entail cobbling together selected symptoms in people suffering from multiple disorders (for example, phobias, depression, and personality disorders) and then attributing these familiar problems to a traumatic (15) event. Moreover, the very fact that the movement to include the diagnosis in the *DSM-III* arose from Vietnam veterans' advocacy groups working with antiwar psychiatrists prompted concerns that PTSD was more of a political or social construct (20) rather than a medical disease discovered in nature.

Although the aforementioned two concerns have again resurfaced in contemporary debates about PTSD, additional issues have arisen as well. For example, the concept of a traumatic stressor (25) has broadened to such an extent that, today, the vast majority of American adults have been exposed to PTSD-qualifying events. This state of affairs is drastically different from the late 1970s and early 1980s, when the concept of trauma was (30) confined to catastrophic events falling outside the perimeter of everyday experience. Early 21st-century scholars are raising fresh questions about the syndromic validity of PTSD.

Passage B

This passage is adapted from *Post-Traumatic Stress Disorder*, edited by Dan J. Stein MD, PhD, Matthew J. Friedman, MD, and Carlos Blanco, MD, PhD (2011).

Of the many diagnoses in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*), very few invoke an aetiology in their diagnostic criteria: (i) organic mental disorders (caused, for example, by a neurological abnormality); (ii) substance-use disorders (caused, for example, by psychoactive chemical agents); (iii) post-traumatic stress disorder (PTSD); (iv) acute stress disorder (ASD); and (v) adjustment disorders (ADs). The latter three are all caused by exposure to a stressful environmental event that exceeds the coping capacity of the affected individual. The presumed causal relationship between the stressor and PTSD, ASD, and AD is complicated and controversial. Controversy notwithstanding, acceptance of this causal relationship has equipped practitioners and scientists with a conceptual tool that has profoundly influenced clinical practice over the past 30 years.

PTSD is primarily a disorder of reactivity rather than of an altered baseline state, as in major depressive disorder or general anxiety disorder. Its psychopathology is characteristically expressed during interactions with the interpersonal or physical environment. People with PTSD are consumed by concerns about personal safety. They persistently scan the environment for threatening stimuli. When in doubt, they are more likely to assume that danger is present and will react accordingly. Avoidance and hyper-arousal symptoms can be understood within this context. The primacy of traumatic over other memories (for example, the re-experiencing symptoms) can also be understood as a pathological exaggeration of an adaptive human response to remember as much as possible about dangerous encounters in order to avoid similar threats in the future.

10. According to Passage A, psychiatrists opposed to PTSD's inclusion in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*) based their arguments on the following points, EXCEPT:

(F) Today's definition of catastrophic trauma is a far cry from what it was in the late 1960s and early 70s.

(G) PTSD sufferers could already be grouped into one or more existing diagnosis categories.

(H) What qualifies as a "stressor" by today's definition has become far too broad.

(J) PTSD is more of a social and political construct than a legitimate affliction.

11. The author's attitude in Passage A can best be described as:

(A) contemplative.

(B) indecisive.

(C) explanatory.

(D) argumentative.

12. The author of Passage A refers to the 1970s and 1980s in order to:

(F) show how far American medicine has come over time.

(G) highlight a time that saw numerous catastrophic events.

(H) compare the number of PTSD sufferers between then and now.

(J) reveal how America's definition of "trauma" has changed over time.

13. Which of the following sentences best summarizes the main idea of Passage B?

(A) PTSD is controversial, but it has had a profound impact on both sufferers and the medical profession as a whole over the years.

(B) PTSD is a legitimate, debilitating condition that deserves additional research and financial resources.

(C) PTSD was given a name largely because medical professionals needed a way to categorize veterans suffering from various mental conditions after returning from war.

(D) PTSD is no longer an accurate diagnosis, because the world has come to accept any number of situations as "stressors" that might set it off.

14. The author of Passage B makes all of the following assertions about PTSD EXCEPT:

(F) that it is caused by exposure to a particularly stressful environmental factor that is more than the affected individual can handle.

(G) that PTSD is a disorder that results from an altered baseline state.

(H) that PTSD sufferers frequently search their surroundings for anything that might be viewed as a threat.

(J) that clinical practice over the years has been largely influenced by the acceptance of a causal relationship between a stressor and the onset of PTSD.

15. Which of the following best demonstrates the different perspectives between the psychiatrists and scholars mentioned in Passage A and the author of Passage B?

(A) The psychiatrists in Passage A think that the definition of PTSD has become too broad, while the author of Passage B feels it is a legitimate condition that has played an important role in clinical practice.

(B) The psychiatrists and scholars in Passage A believe that PTSD is a genuinely debilitating condition, while the author of Passage B believes today's doctors are too quick to offer up a PTSD diagnosis.

(C) The psychiatrists and scholars in Passage A believe that PTSD is simply a combination of other existing conditions, while the author of Passage B feels that PTSD is a disorder of an altered baseline state.

(D) The psychiatrists and scholars in Passage A believe that social conditions led to the theory behind PTSD, while the author of Passage B believes it was politics.

16. The authors of both passages are most likely to agree on which of the following statements?

(F) PTSD is a disorder of reactivity.

(G) The use of the PTSD diagnosis is highly political.

(H) PTSD sufferers are overly concerned with personal safety.

(J) PTSD is a highly controversial condition.

17. The authors of either Passage A or Passage B make all of the following assertions about the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*) EXCEPT:

(A) that few diagnoses listed also list causes.

(B) that psychiatrists initially did not want PTSD listed in the publication.

(C) that PTSD appeared in its third edition.

(D) that the information it contains about PTSD is wholly insufficient.

18. Which of the following statements is consistent with information contained in both passages?

(F) PTSD is caused by stressful factors that exceed one's ability to cope, and scientists and medical professionals are often too quick to make the proper diagnosis.

(G) PTSD is an increasingly prevalent problem in America, and years of research must be devoted to its causes and treatment.

(H) The PTSD diagnosis is a controversial one, and scientists and medical professionals have differing opinions on its causes and its inclusion in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)*.

(J) Scientists and medical professionals disagree over which stressors are sufficient to lead to PTSD.

Passage III — Humanities

Line

Adapting literature for the screen can be daunting. To increase one's chances of creating a successful adaptation, Linda Seger suggests choosing original works with a good story. In her book, *The Art of Adaptation*, Seger goes on to clarify that a good story contains three elements: a goal, a problem or an issue, and a life-altering journey.

Almost every aspect of life is touched by change. Outer physical change is readily apparent: Babies grow into adults, winter becomes spring, natural structures build up and erode. Less tangible

but not less important are the inner changes that human beings experience. Just as a disruption of normal physical growth is unhealthy, so is a lack of inner growth. Although inner growth and change is healthy and exciting, it also requires courage and discernment. Journeying from a familiar state to a different one means sacrificing what is known and comfortable for something that is unknown and uncertain, and this transformation involves risk. Inner growth comes at a price, and humans face a fundamental dilemma: To change requires a sacrifice of the old and familiar, but to remain static is to sacrifice a chance at new life.

Experiencing myth and ritual in film may assist people with this universal dilemma. According to Joseph Campbell in his book *The Hero with a Thousand Faces*, the purpose and effect of myth and ritual ". . . was to conduct people across those difficult thresholds of transformation that demand a change in the patterns not only of conscious but also of unconscious life." Myth serves to draw people into and through the important transformation journey.

Through an examination of myths and rituals, Campbell distinguishes what he called the monomyth, a heroic quest for an immensely precious treasure at high personal cost. The hero of the monomyth endures a series of trials and even death or a death-like experience that liberates the hero from the past limitations of his old existence and renews life's possibilities. Mythology not only documents the transformation process of a mythic hero but also provides a means for other people to experience the hero's transformation.

Campbell claims it is "the prime function of mythology and rite to supply the symbols that carry the human spirit forward, in counteraction to those other constant human fantasies that tend to tie it back." Myth may carry out this function by providing a vicarious heroic journey for the one who encounters myth in film adaptations of literary works. As viewers experience the transformations of film characters, they may gain insight into possibilities for their own heroic quests and, through contact with the stories of others, may embark on their own transformational journeys into more mature human beings.

19. The author's primary purpose in writing this passage is most likely to:

(A) establish that to create a well-executed screen adaptation, one should choose a story modeled on a mythological journey.

(B) show that positive change is not possible without taking risks.

(C) warn that screenwriters should not attempt to adapt literary works that do not contain a mythic journey.

(D) reveal that a good film adaptation contains a series of trials and a near-death experience.

20. The author of the passage suggests that inner growth requires:

(F) an unhealthy forfeiture of established patterns of living and an acceptance of necessary risks.

(G) viewing film adaptations of literary works.

(H) courage to remain constant in changeable and unfamiliar environments.

(J) sacrifice of one's comfortable fantasies and the exploration of uncharted territory.

21. Which of the following would the author of the passage be most likely to include in the list along with "… babies grow into" (line 11)?

(A) Taste preferences change to include a wider appreciation of foods.

(B) Young adults in their twenties make wiser decisions than adolescents.

(C) Brown hair thins and turns to gray.

(D) Best friends become strangers.

22. In saying "to change requires a sacrifice of the old and familiar, but to remain static is to sacrifice a chance at new life" (Line 25), the author most likely means that:

(F) sacrifice is inevitable.

(G) change of any kind is better than no change at all.

(H) a life-altering journey is ultimately more fulfilling than the actual change one achieves as a result.

(J) being resistant to change requires a more substantial risk than does facing the unknown.

23. The primary purpose of the second paragraph is to:

(A) outline some of the ways humans may achieve inner growth.

(B) offer a more detailed description of one of the components of a good story.

(C) encourage the reader to risk inner growth by journeying from familiar to unfamiliar circumstances.

(D) provide examples of some physical alterations humans may experience throughout their lives.

24. Each of the following is a characteristic of Campbell's monomyth EXCEPT:

(F) liberation from past limitations.

(G) great personal risk.

(H) constant human fantasies.

(J) a search for treasure.

25. According to Campbell, the purpose of ritual is to:

(A) transform a person's unintentional patterns.

(B) give people the tools to help others cross difficult thresholds in their lives.

(C) force people to break bad habits.

(D) promote a rich fantasy life.

26. When the author refers to "this universal dilemma" (line 27), she most likely means:

(F) deciding whether to experience myth and ritual in films.

(G) choosing between conscious and unconscious thoughts.

(H) forgoing comfortable patterns to take on new challenges.

(J) engaging in activities that promote physical growth.

27. Based on information in the passage, Linda Seger is most likely which of the following?

(A) Mythic hero

(B) Film script consultant

(C) Book critic

(D) Psychologist

Passage IV — Natural Science

This passage is adapted from *Reading the Weather*, by T. Morris Lonstreth.

If there is anything that has been overlooked more than another it is our atmosphere. But it absolutely cannot be avoided, because if it were not for the atmosphere this earth of ours would be a wizened and sterile lump.

To be sure the earth does not loom very large in the eye of the sun. It receives a positively trifling fraction of the total output of sunheat. So negligible is this amount that it would not be worth our mentioning if we did not owe our existence to it. It is thanks to the atmosphere, however, that the earth attains this (borrowed) importance. It is thanks to this thin layer of gases that we are protected from that fraction of sunheat which, however insignificant when compared with the whole, would otherwise be sufficient to fry us all in a second. Without this gas wrapping, we would all freeze (if still unfried) immediately after sunset. The atmosphere keeps us in a sort of thermos globe, unmindful of the burning power of the great star, and of the uncalculated cold of outer space.

Yet, limitless as it seems to us, our invaluable atmosphere is a small thing after all. Half of its total bulk is compressed into the first three and a half miles upward. Only one sixty-fourth of it lies

above the twenty-one mile limit. Compared with the thickness of the earth this makes a very thin envelope.

Light as air, we say, forgetting that this stuff that looks so inconsequential weighs fifteen pounds to the square inch. The only reason that we don't crumble is because the gases press evenly in all directions, thereby supporting this crushing burden. A layer of water thirty-four feet thick weighs just about as much as this air-pack under which we feel so buoyant. But if these gases get in motion we feel their pressure.

As it blows along the surface of the earth this wind is mostly nitrogen, oxygen, moisture, and dust. The nitrogen occupies nearly eight-tenths of a given bulk of air, the oxygen two-tenths, and the moisture anything up to one-twentieth. Five other gases are present in small quantities. The dust and the water vapor occupy space independently of the rest. As one goes up mountains the water vapor increases for a couple of thousand feet and then decreases to the seven mile limit after which it has almost completely vanished. The lightest gases have been detected as high up as two hundred miles and scientists think that hydrogen, the lightest of all, may escape altogether from the restraint of gravity.

At first glance the extreme readiness of the atmosphere to carry dust and bacteria does not seem a point in its favor. In reality it is. Most bacteria are really allies of the human race. They benefit us by producing fermentations and disintegrations of soils that prepare them for plant food. It is a pity that the few disease breeding types of bacteria should have given the family a bad name. Without bacteria the sheltering atmosphere would have nothing but desert rock to protect.

Further, rain is accounted for only by the dust. Of course this sounds very near the world's record in absurdities. But it is a half-truth at least, for moisture cannot condense on nothing. Every drop of rain, every globule of mist must have a nucleus. Consequently each wind that blows, each volcano that erupts is laying up dust for a rainy day. Apparently the atmosphere is empty. Actually it is full enough of dust-nuclei to outfit a full-grown fog if the dew point should be favorable. If there were no dust in the air all shadows would be intensest black, the sunlight blinding.

But the dust particles fulfill their greatest mission as heat collectors — they and the particles of water vapor which have embraced them. It is in reality owing to these water globules and not to the atmosphere that supports them that we are enabled to live in such comfortable temperatures.

So it comes about that the heavy moist air near the earth is the warmest of all. So high altitudes and low temperatures are found together. But after the limit of moisture content has been reached the temperature gets no lower according to reliable investigations. Instead a monotony of 459° below zero eternally prevails –459° is called the absolute zero of space.

The vertical heating arrangements of the atmosphere appear somewhat irregular. But horizontally it is in a much worse way. The surface of the globe is three quarters water and one quarter land and irregularly arranged at that. The shiny water surfaces reflect a good deal of the heat which they receive, they use up the heat in evaporation and what they do absorb penetrates far. The land surfaces, on the contrary, absorb most of the heat received, but it does not penetrate to any depth. As a consequence of these differences, land warms up about four times as quickly as water and cools off about four times as fast. Therefore, the temperature of air over continents is liable to much more rapid and extreme changes than the air over the oceans.

28. The primary purpose of the passage is to:

(F) explain why the earth's temperatures rise and fall.

(G) highlight the role of dust particles in determining the weather.

(H) explore the many roles of bacteria.

(J) describe the role of the earth's atmosphere.

29. The author makes all of the following assertions about dust EXCEPT:

(A) dust plays a larger role in producing warm temperatures than the atmosphere.

(B) dust accounts for only rain.

(C) particles of dust form the nucleus of rain droplets.

(D) volcanic eruptions and blowing winds are some of the sources of dust layers.

30. According to the author, the wind, as it blows along the surface of the earth, is comprised of all the following EXCEPT:

(F) dust particles.

(G) nitrogen gas.

(H) bacteria.

(J) hydrogen.

31. According to the passage, what does the author consider dust's most important role?

(A) Serving as a heat collector.

(B) Forming the basis of rain.

(C) Minimizing the sun's glare.

(D) Providing a thick layer of protection around the earth.

32. Which of the following does the author consider one of the world's absurdities?

(F) Without dust, sunlight would be blinding.

(G) The irregularly configured surface of the earth is made up of three quarters water and one quarter land.

(H) Air temperatures over vast expanses of land are prone to much more rapid and extreme changes than the temperatures over oceans.

(J) No other factors but dust account for the presence of rain.

33. The main point of the last paragraph is that:

(A) air over water and air over land are subject to different heating and cooling patterns.

(B) the earth's vertical heating arrangements are better than its horizontal heating arrangements.

(C) land surfaces absorb most of the heat received by the sun.

(D) deficiencies in the earth's atmosphere create dangerously extreme variances in temperature.

34. According to the author, the element that prevents humans from burning under the sun's heat is:

(F) a small fraction of sunheat.

(G) the uncalculated cold of outer space.

(H) a thin layer of gases weighing just about fifteen pounds to the square inch.

(J) a thick layer of gases that forms a sort of thermos globe.

35. The word *trifling* in line 7 most likely means

(A) shallow.

(B) insignificant.

(C) silly.

(D) novel.

36. When the author claims that "dust and water vapor occupy space independently of the rest" (lines 43–45), he most likely means:

(F) gases become lighter as one climbs higher into the atmosphere.

(G) dust and water make up more of the air's atmosphere than nitrogen does.

(H) moisture and dust exert more atmospheric pressure than gases.

(J) the properties of dust and water vapor are not determined by the other components of the atmosphere.

Science Test (Optional)

TIME: 40 minutes for 40 questions

DIRECTIONS: Following are seven passages and then questions that refer to each passage. Choose the best answer and shade in the corresponding oval on your answer sheet.

Passage I

A conductivity meter measures the electrical conductivity in a solution and is used to measure the number of impurities in freshwater. One way to purify water is to remove ions. A solution with a higher ion content has a higher conductivity than a solution with fewer ions. A group of scientists studied water solution samples from 3 different sites from which they took 3 separate measurements — temperature in degrees Celsius, conductivity ($\mu S/m$), and species richness (number of invertebrate species found) — 10 different times. Site 1 was located 5 kilometers upstream of the city center, Site 2 was located in the city center, and Site 3 was 5 kilometers downstream of the city center. Temperature and conductivity were measured with a conductivity meter. Species richness was collected, and invertebrates were placed in 98% ethanol to preserve the specimens. The collection was taken to the lab and dissecting microscopes were used to count and identify the invertebrate species. The results are shown in Table 1.

TABLE 1

Site 1: Upstream			*Site 2: City Center*			*Site 3: Downstream*		
Temperature (Celsius)	*Conductivity (µS/m)*	*Species Richness*	*Temperature (Celsius)*	*Conductivity (µS/m)*	*Species Richness*	*Temperature (Celsius)*	*Conductivity (µS/m)*	*Species Richness*
23	200	10	25	900	1	22	655	5
23	155	12	24	800	2	23.5	599	4
24	220	11	23	821	1	22.5	621	6
23.5	185	9	23	906	3	25	632	4
24	188	10	24	855	2	25	588	5
22.5	190	11	22	899	1	24	612	7
25	203	14	23	865	4	23	641	6
24	253	12	24	845	1	23	625	5
23	211	10	22	933	2	23.5	598	4
25	177	8	23	865	2	24	600	3
23.7	198.2	10.7	23.3	868.9	1.9	23.6	617.1	4.9

1. Based on Table 1, in Site 1, as the temperature of the solution increased, conductivity:

(A) increased only.

(B) decreased only.

(C) stayed the same.

(D) varied with no general trend.

2. The scientists' research suggests that the collection site or sites whose water solution contains the greatest number of impurities is/are:

(F) Site 1

(G) Site 2

(H) Site 3

(J) Site 1 and Site 3

3. The conductivity of typical drinking water ranges between 50 and 500 $\mu S/m$. Based on the results of the scientists' research, which of the three sites contain(s) water solutions that may be safe to drink?

(A) Site 1 only

(B) Site 3 only

(C) Site 1 and Site 2

(D) Site 2 and Site 3

4. Suppose an additional study was conducted in the same manner at a site located in rural pastureland several miles upstream from Site 1. The average conductivity of this site was measured to be 500 $\mu S/m$. The average species richness of this new site would most likely be:

(F) less than 1.9.

(G) between 1.9 and 4.9.

(H) between 4.9 and 10.7.

(J) greater than 10.7.

5. The scientists most likely used which of the following to collect the data necessary to determine species richness?

(A) Balance

(B) pH meter

(C) Nets

(D) Thermometer

Passage II

Convict cichlids are highly aggressive freshwater fish that are found in streams and rivers in Central America. Their aggression allows them to protect their breeding territory from intruders that enter and consume their offspring. Both males and females are aggressive, and aggressiveness is also related to size.

Experiment 1

Researchers collected 30 males and 30 females and separated them into 3 categories based on size: small (50–69 mm), medium (70–89 mm), and large (90–109 mm). They allowed one fish (the focal fish) to claim a territory in an aquarium tank for 5 days. On day 6, they placed an intruder of equal size to and of the same sex as the focal fish into the aquarium and watched the aggressive behaviors for 30 minutes. Aggressive behaviors viewed were lateral displays, frontal displays, biting, mouth wrestling, and chasing. All behaviors were lumped together, and the total time spent in these behaviors was averaged for each group. Table 1 records the findings of average number of minutes

within 30-minute time periods that the convict cichlid fish exhibited acts of aggression based on size and sex.

TABLE 1

	Small (50–69 mm) Focal Fish & Intruder	*Medium (70–89 mm) Focal Fish & Intruder*	*Large (90–109 mm) Focal Fish & Intruder*
Males	12	18	23
Females	6	10	14

Experiment 2

Researchers repeated Experiment 1 but varied the size of the intruder they introduced into the tank on day 6. In the study, 10 females and 10 males received an intruder that was 20 mm smaller than the focal fish, 10 females and 10 males received an equal-sized intruder, and 10 males and 10 females received an intruder that was 20 mm larger than the focal fish. All intruders were the same sex as the focal fish. The same types of aggressive behaviors as those in Experiment 1 were observed for 30 minutes and recorded. Behaviors were grouped together, and the total time spent in these behaviors was averaged for each group. Table 2 records average number of minutes of aggression within a 30-minute time period in convict cichlid fish based on intruder size and sex.

TABLE 2

	Intruder 20 mm Smaller than Focal Fish	*Equal-Sized Intruder*	*Intruder 20 mm Larger than Focal Fish*
Males	12	20	11
Females	6	11	5

6. The two experiments were likely designed to answer which of these questions?

(F) Are highly aggressive fish more likely to exist in fresh or saltwater?

(G) What are the most common types of aggressive behaviors exhibited by convict cichlids?

(H) Is size or gender a better indicator of the potential for aggression in convict cichlids?

(J) How does the relative size of an intruder fish affect the number of aggressive behaviors exhibited by a focal fish?

7. According to Experiment 1, which of the following is the correct order of cichlids from highest to lowest aggression?

(A) Large female, large male, medium female, small male.

(B) Large male, large female, medium male, small female.

(C) Large male, medium male, large female, small male.

(D) Large male, medium male, small male, large female.

8. Based on Experiment 1 and Experiment 2, male cichlids exhibited:

(F) about half as much aggression as female cichlids.

(G) about twice as much aggression as female cichlids.

(H) about the same amount of aggression as female cichlids.

(J) about half as much aggression as female cichlids in Experiment 2 and about twice as much aggression as female cichlids in Experiment 1.

9. Experiment 1 and Experiment 2 differed in that Experiment 2 varied which independent variable?

(A) Gender of the intruder.

(B) Relative size of the intruder to focal fish.

(C) Level of aggression in the intruder.

(D) Number of days provided for the focal fish to establish its territory.

10. The scientists who conducted the research wanted to use the lab data to determine which combination of two cichlids would be the best protectors of their offspring. Based on the results of the two experiments, which of the following pairs was the one the scientists likely concluded was the best?

(F) Medium male paired with a large female.

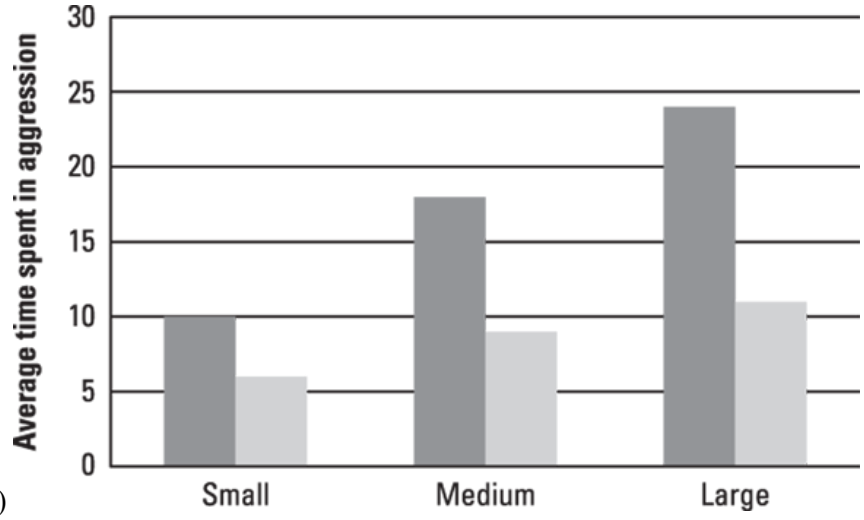
(G) Large male paired with a small female.

(H) Medium male paired with a medium female.

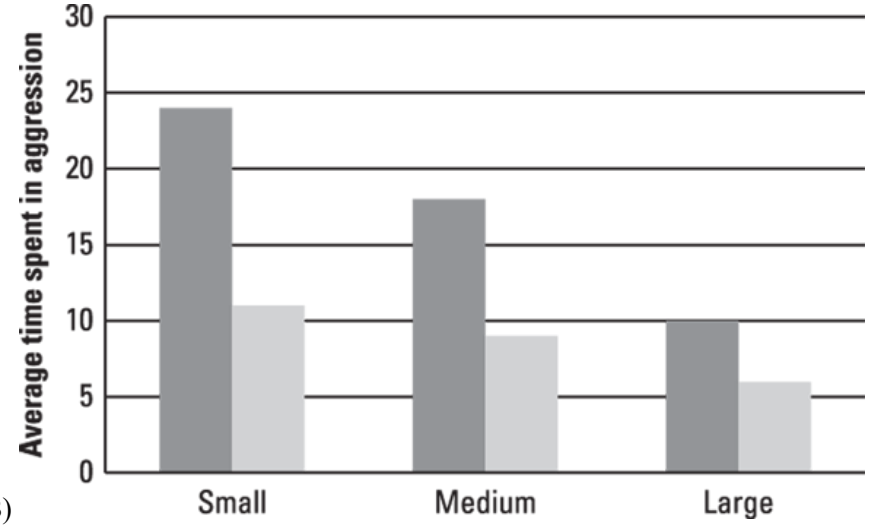
(J) Small male paired with a small female.

11. Where dark gray bars represent male cichlids and light gray bars represent female cichlids, which of the following graphs provides the most accurate representation of the results of Experiment 2?

(A)



(B)



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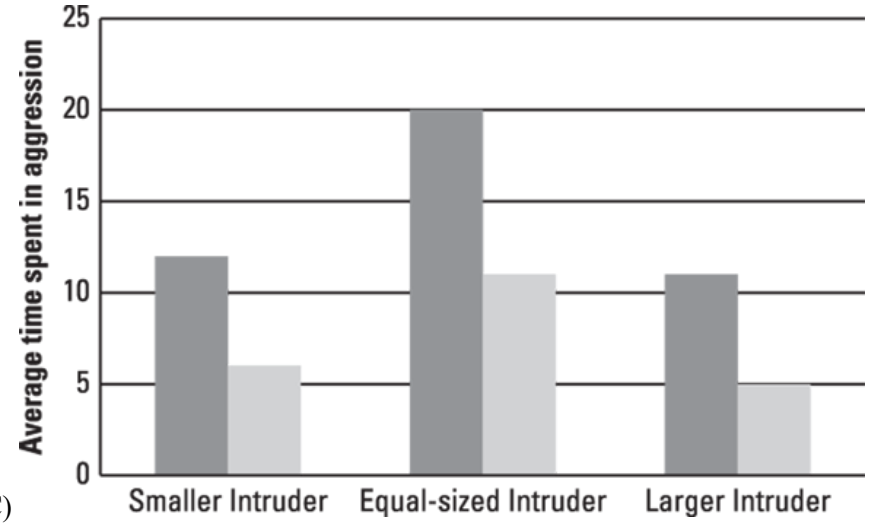
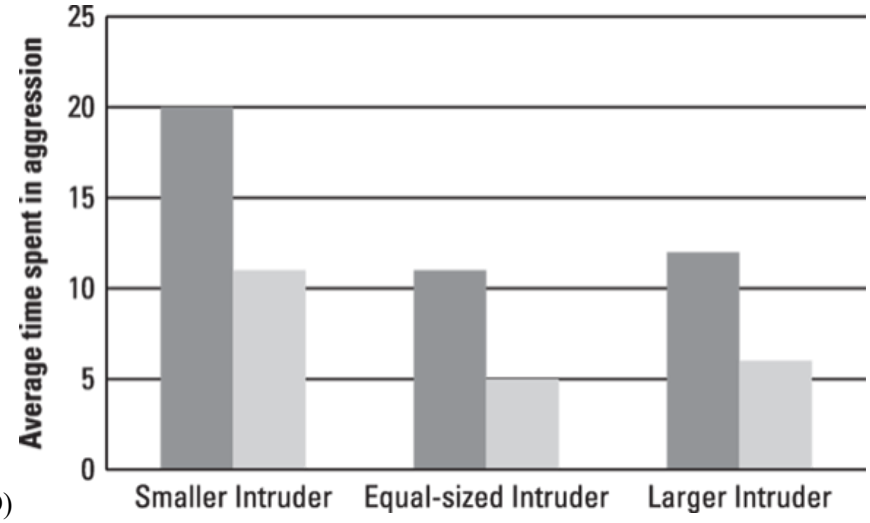


(D)



Passage III

Genetically modified organisms (GMOs) are any organisms that are modified with respect to their genetics. A wide range of methods exist for producing GMOs, from procedures as simple as selective breeding (which has been conducted for thousands of years) to the more recent technology of inserting genes of one organism into those of another organism. GMOs have been used to produce medical advances such as creating insulin for people with diabetes. However, more recently there have been debates over the role GMOs should play in foods.

Two researchers present their opinions.

Researcher 1

GMO foods were first designed in an attempt to control pests without using pesticides. Traditional pesticides can be harmful to the environment, so reducing pesticides would provide significant environmental benefits. In addition, GMO foods are thought to increase crop yields. Given that our world population continues to grow exponentially, food may become a limited resource and using genetically modified foods may assist in the sustenance of an exploding global population. GMOs have been a part of food production for several decades, and no scientific evidence exists to support the view that the nutritional value of GMOs is less than that of food that has not been genetically

modified. Nor does evidence suggest that GMOs cause harm to the organisms that consume them. Some studies have reported minor increases in food allergies associated with GMOs, but that information is likely correlational, not causational.

Researcher 2

Genetically modified foods may have been first implemented to replace pesticides, but recent data shows that pests become resistant to the GMO plants more quickly than to plants that have not been genetically modified and are treated with pesticides. Reducing pesticides benefits the environment, but this reduction can be achieved without resorting to producing GMOs. Planting a variety of species instead of monocultures and using natural pest repellants (e.g., lady bugs) would reduce pesticide use in a better way than GMOs. Not all GMOs yield higher crops, and other options to combat limited food production, such as home and community gardening, exist. Placing the burden of food production on individuals would reduce the strain on big corporations. Recent efforts in urban areas include converting spaces on rooftops to community farms. Although current studies show no direct correlation between GMOs and health problems in humans, GMOs have not been studied long enough to rule out the possibility of long-term effects. The nutritional value of GMOs may be similar to that of organically grown food, but the taste and overall quality are not. Anyone who has eaten both organic foods and GMOs will attest to the former's superiority. The last problem with GMOs is that cross contamination can occur. Plant pollen can travel long distances and GMO plants can hybridize with organic crops.

12. According to Researcher 1, what are the benefits of GMOs?

(F) They reduce pesticide use and increase crop yields.

(G) They increase pesticide use and decrease crop yields.

(H) They increase the nutritional value of food and do not cause harm to organisms.

(J) Researcher 1 sees no benefits of GMOs.

13. According to the passage, with which of the following statements would both researchers agree?

(A) Increasing pesticide use would be good for the environment.

(B) There is no direct correlation between GMOs and health problems in humans.

(C) GMO foods have improved taste and quality.

(D) GMO foods increase food allergies in many of the humans who consume them.

14. According to Researcher 2, a major disadvantage of GMOs is that:

(F) their pollen can travel long distances.

(G) their use decreases the number of naturally occurring pest reducers.

(H) their use increases the prevalence of harmful pesticides.

(J) they are directly correlated with health problems in humans.

15. According to Researcher 1, a harmful effect that may be correlated to GMO foods is:

(A) pesticide resistance.

(B) production of tumors in consumers.

(C) decreased nutritional value.

(D) increased food allergies in consumers.

16. According to Researcher 2, the use of pesticides may be reduced by all of the following EXCEPT:

(F) replacing only some organically grown crops with GMOs.

(G) planting a variety of species instead of monocultures.

(H) using ladybugs as repellants.

(J) increasing the number of community farms.

17. According to Researcher 2, GMOs have been linked to which of the following?

(A) An increase in the number of pesticides.

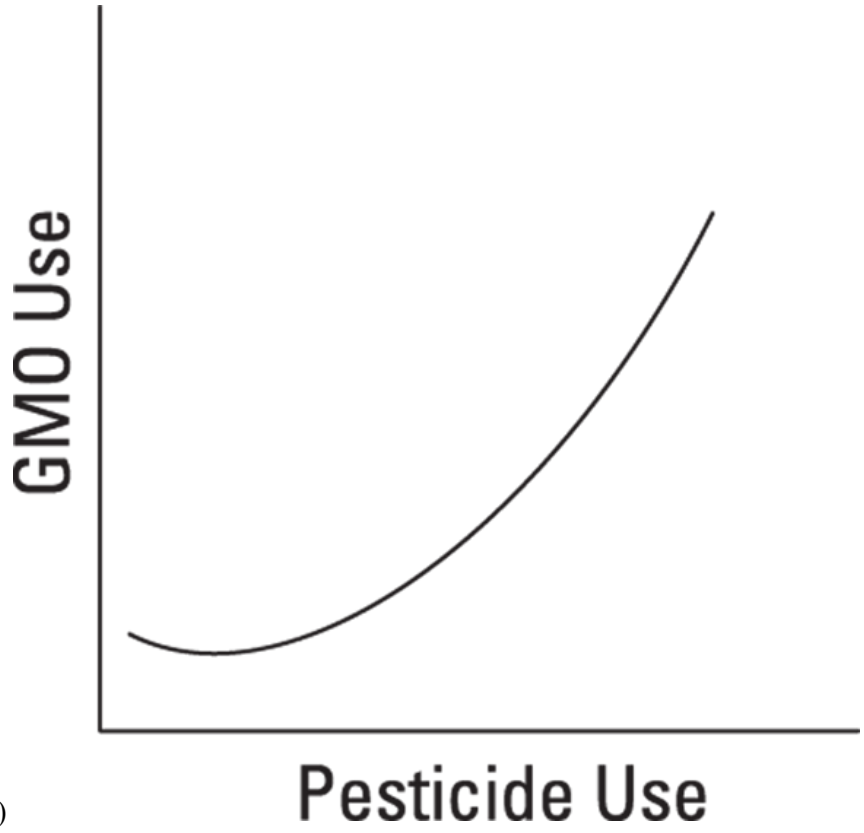
(B) An increase in the number of home and community gardens.

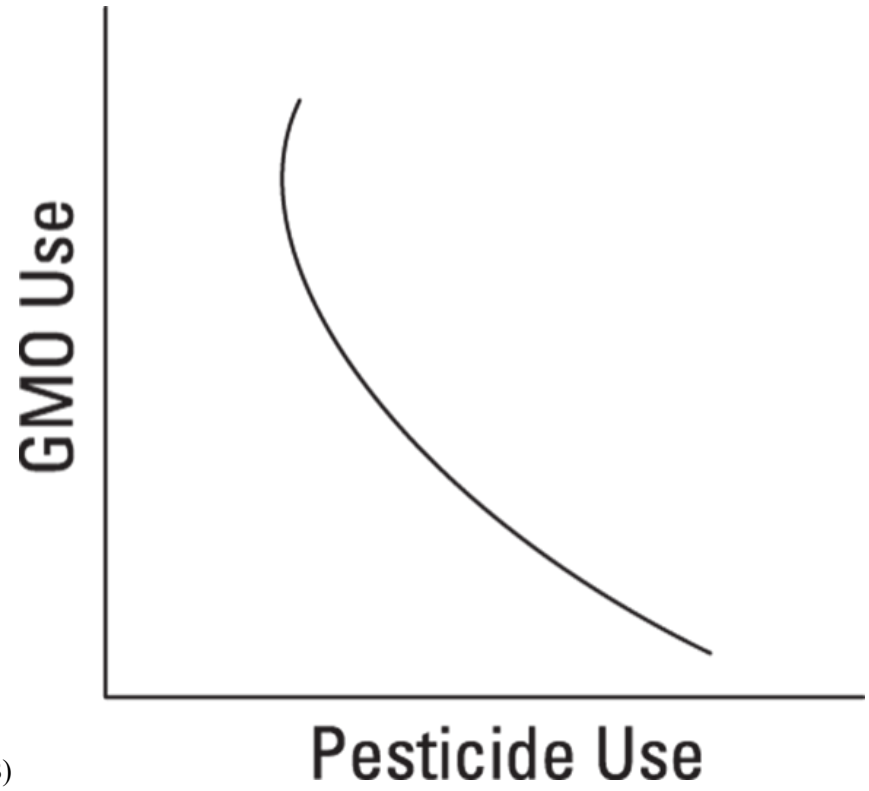
(C) Inferior food quality.

(D) A larger burden placed on food-producing corporations.

18. Which of the following graphs is consistent with Researcher 1's view but not Researcher 2's?

(A)





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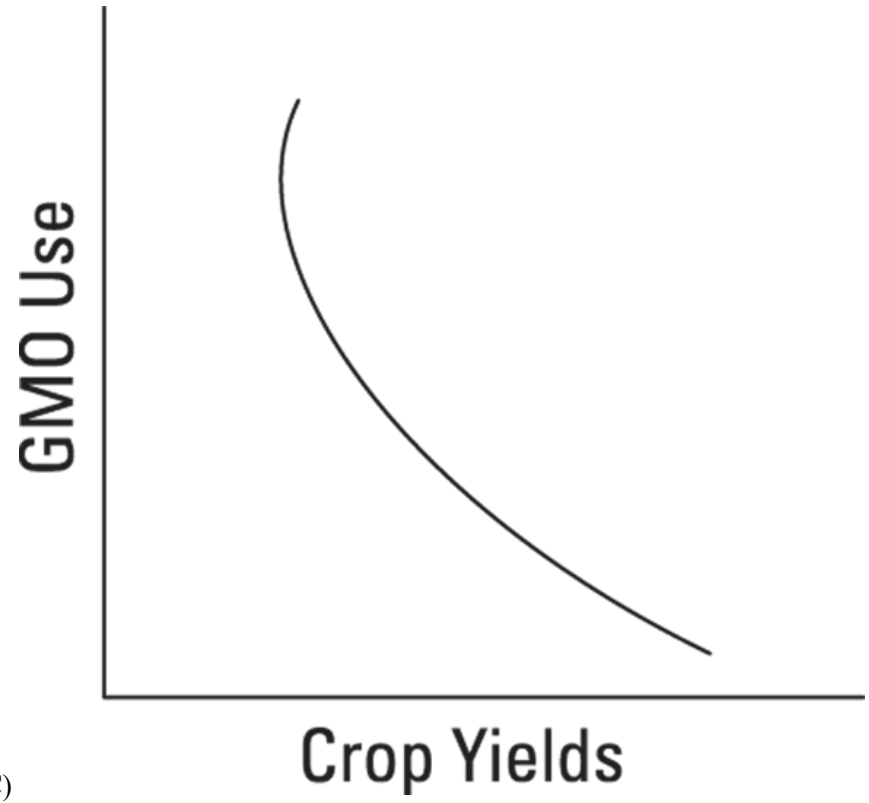
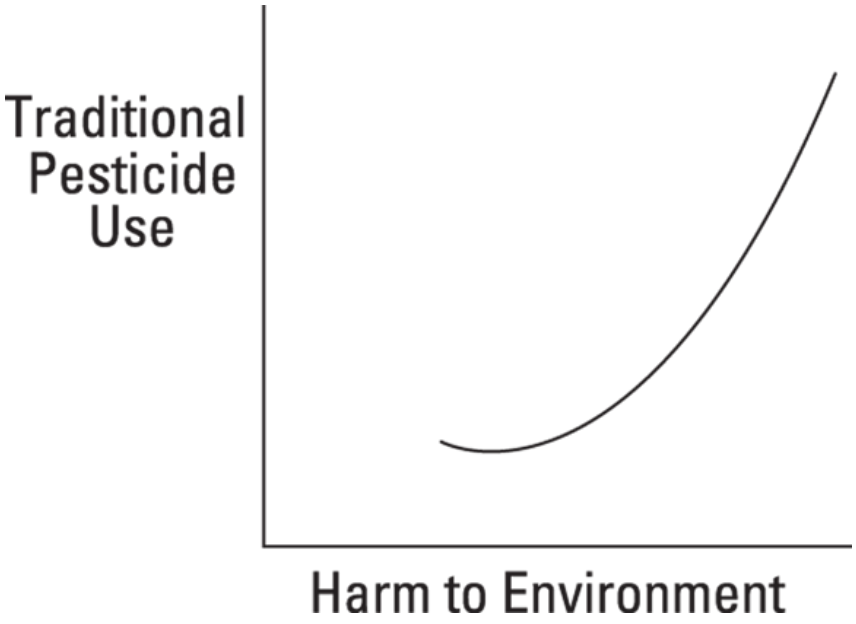


(C)

(D)



Passage IV

Plants need several elements to grow, such as light, water, and nutrients. The most important nutrients are nitrogen (N), phosphorus (P), and potassium (K). These inorganic nutrients are converted from organic nutrients during the process of decomposition. Certain organisms, called *decomposers*, help speed up the process of decomposition. Researchers wanted to test whether applying decomposers in the form of compost or synthetic fertilizers were better for growing plants. In addition, the researchers wanted to determine the optimal light conditions for plant growth. The researchers conducted the following two experiments, where the amount of water applied in each case was kept at a constant.

Experiment 1

The three researchers set up three treatment groups. In each contained environment, the researcher planted 20 pea seeds. The first treatment group contained sandy soil with nothing else added. The second treatment group contained sandy soil to which was added a compost mixture by earthworm decomposers. The third group contained potting soil that was enriched with synthetic fertilizers. Once planted, the seeds received 12 hours of sunlight per day and were watered once a day for eight weeks. After eight weeks, each plant stem was measured from the top of the soil to the top of the main stem. The researchers recorded the measurements in Figure 1.

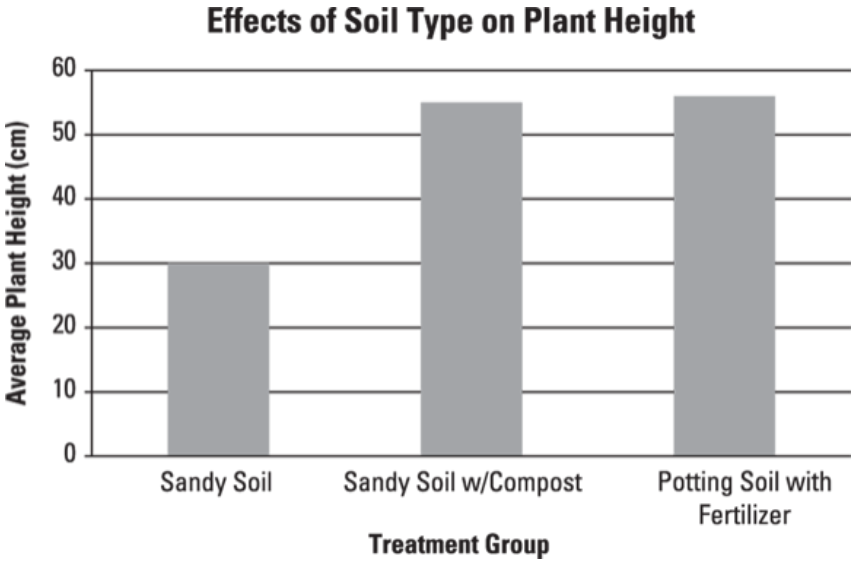


FIGURE 1

Experiment 2

The same experiment was conducted using only the sandy soil mixed with earthworm-generated compost for all 60 plants. Each treatment group received different amounts of daily exposure to sunlight. One group received 6 hours, another 10 hours, and the other 14 hours of sunlight. Each group received 20 seeds that were planted at the same time and were watered once a day for 8 weeks. After 8 weeks, each plant stem was measured from the top of the soil to the top of the main stem. The results are displayed in Table 1.

TABLE 1

Hours of Daily Sunlight	*Plant Height (cm)*
6	40
10	50
14	59

19. Which of the following is an independent variable in the two experiments?

I. Type of soil
II. Plant height
III. Hours of sunlight

(A) I only
(B) II only
(C) I and III only
(D) I, II, and III

20. According to the results of the two experiments, the environment that would produce the greatest amount of plant growth would be:

(F) sandy soil and at least 12 hours of daily sunlight.

(G) sandy soil with compost and at least 10 hours of daily sunlight.

(H) Potting soil and at least 6 hours of daily sunlight.

(J) Potting soil and at least 14 hours of daily sunlight.

21. Which of the following best describes the difference between the two experiments?

(A) In Experiment 1, light length per day was varied; in Experiment 2, the soil type was varied.

(B) In Experiment 1, light length per day was constant; in Experiment 2, the soil type was varied.

(C) In Experiment 1, the soil type was varied; in Experiment 2, light length per day was varied.

(D) In Experiment 1, the soil type was varied; in Experiment 2, the amount of daily water was varied.

22. If the researchers set up a third experiment similar to Experiment 2 where they tested the effect of the amount of daily sunlight on seeds grown in the potting soil, then based on the results of Experiments 1 and 2, they could reasonably predict which of the following about the average height of the resulting plants in Experiment 3?

(F) For all hours of sunlight exposure, plant height after eight weeks in Experiment 3 would be taller than plant height after eight weeks in Experiment 2.

(G) For all hours of sunlight exposure, plant height after eight weeks in Experiment 3 would be shorter than plant height after eight weeks in Experiment 2.

(H) For all hours of sunlight exposure, plant height after eight weeks in Experiment 3 would be similar to plant height after eight weeks in Experiment 2.

(J) Plant height for seeds exposed to ten hours of daily sunlight after eight weeks in Experiment 3 would be shorter than plant height of those grown in only sandy soil after eight weeks in Experiment 1.

23. After conducting Experiments 1 and 2, researchers drew the conclusion that if pea seeds grown in sandy soil with compost were provided 16 hours of daily sunlight under the same conditions as the prior two experiments, their plant height after 8 weeks would measure no more than 65 cm. Is this conclusion reasonable based on the results of the two experiments?

(A) Yes, because the ratio of plant height to number of daily hours of sunlight decreased as the researchers increased the amount of daily sunlight exposure.

(B) Yes, because the ratio of plant height to number of daily hours of sunlight increased as the researchers increased the amount of daily sunlight exposure.

(C) No, because the ratio of plant height to number of daily hours of sunlight decreased as the researchers increased the amount of daily sunlight exposure.

(D) No, because the ratio of plant height to number of daily hours of sunlight increased as the researchers increased the amount of daily sunlight exposure.

24. Which of the following conclusions about plant growth is justified based on the two experiments?

(F) Plant height is increased when seeds receive a combination of increased nutrients, greater exposure to sunlight, and large amounts of water.

(G) Exposure to sunlight has a greater effect on plant height than soil type.

(H) Soil type influences plant height more significantly than either exposure to sunlight or water.

(J) Nutrients in the form of compost and synthetic fertilizers affect plant height similarly.

Passage V

On a scale of 0 to 14, pH measures how acidic or alkaline a solution is. Most living aquatic organisms live at or near pH 7. Scientists from the United States Geological Survey (USGS) confirmed reports of increasing numbers of dead fish in small lakes and ponds within a 3,500 square km area of land over a six-month period, and no known pollutants had entered the affected area. The scientists checked the water quality of the ponds to determine the cause of the mass fish kills.

Experiment 1

The scientists took samples from 10 of the ponds that had experienced increased fish deaths (contaminated ponds) and another 10 ponds in the same area where increased numbers of deaths were not evident (healthy ponds).

Water samples were extracted from each of the 20 ponds for three consecutive mornings at the same time each day. Each sample was tested for temperature and pH levels. The results of the two measurements for the three samples were averaged for each site. The results for the 10 contaminated ponds were then averaged, and separate averages were calculated for the 10 healthy ponds. The averages for both were represented in Figures 1 and 2.

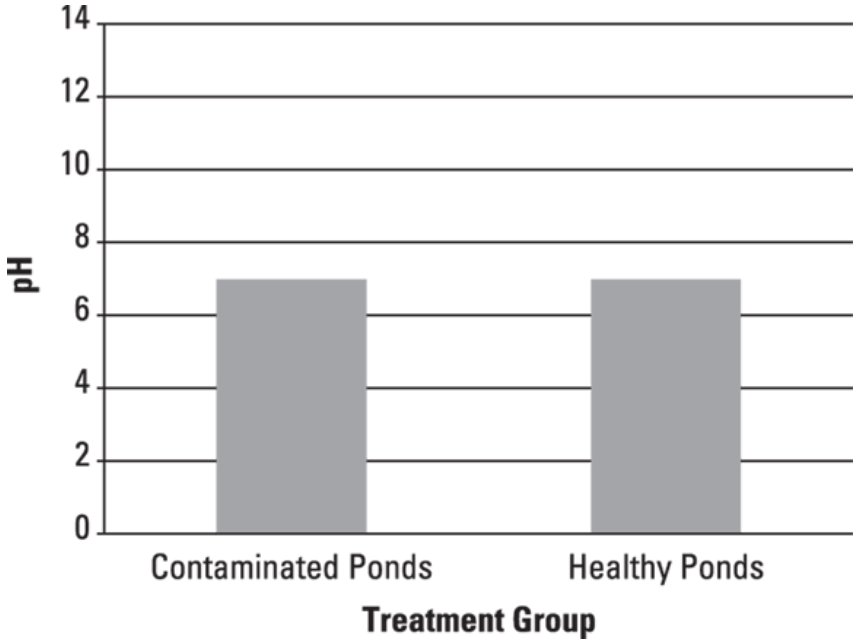


FIGURE 1

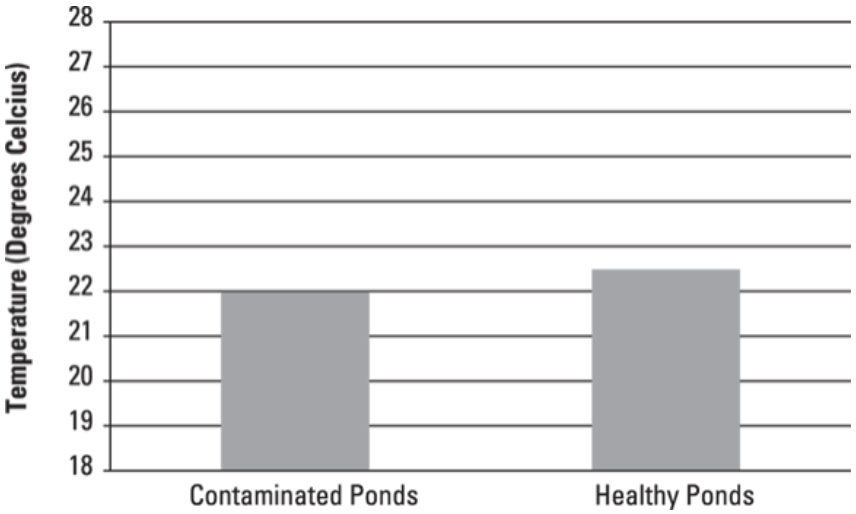


FIGURE 2

Experiment 2

High levels of nitrogen and phosphorus from fertilizer runoff can cause algae blooms, which may indicate increased decomposition and resultant decreases in oxygen (O_2). The scientists conducted a second experiment in which they tested water samples from the same 20 ponds for nitrates (NO_2) and dissolved oxygen (O_2). As in Experiment 1, the measures were averaged and the results were recorded in Figure 3.

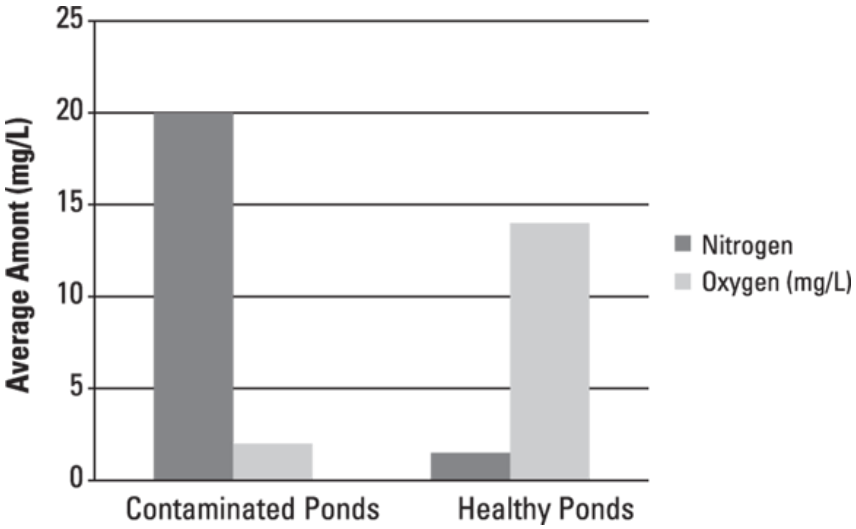


FIGURE 3

25. In Experiment 1, which of the following was true about the contaminated ponds as compared to the healthy ponds?

(A) The pH of the contaminated ponds was higher.

(B) The temperature of the contaminated ponds was higher.

(C) Both pH and temperature were higher in the contaminated ponds.

(D) Neither pH nor temperature was higher in the contaminated ponds.

26. Based on the two experiments, which of the following best expresses the relationship between pH levels and O_2 levels in the two types of ponds?

(F) Pond water with low levels of O_2 had high levels of pH.

(G) Pond water with low levels of O_2 had low levels of pH.

(H) Pond water with high levels of O_2 had pH levels that were more alkaline than acidic.

(J) There is no apparent relationship between pH levels and O_2 levels in the two types of ponds.

27. Based on the information in the passage, which of the pond types likely had more algae blooms?

(A) The contaminated ponds, because their water samples had a higher average ratio of nitrogen to oxygen.

(B) The contaminated ponds, because their average water temperature was higher than that of the healthy ponds.

(C) The healthy ponds, because their water samples had a higher average ratio of nitrogen to oxygen.

(D) The healthy ponds, because their average water temperature was higher than that of the contaminated ponds.

28. Granite contains very few bases. Limestone contains bases. Natural bases can neutralize acids present in the rain, snow, or soil. If the acids are neutralized by the natural bases, the pH of the lake will remain about the same. If the scientists determined that runoff from snowmelt that feeds the ponds in the area has a pH lower than 7, based on information in the passage, which of the following is most likely regarding the composition of the rocks in the two types of ponds?

(F) The contaminated ponds contain more granite-based rock, and the healthy ponds contain more limestone-based rock.

(G) Both types of ponds contain limestone-based rock.

(H) Both types of ponds contain mostly granite-based rock.

(J) The contaminated ponds contain more limestone-based rock, and the healthy ponds contain more granite-based rock.

29. Rapidly moving water tends to contain more dissolved oxygen than do more stagnant bodies of water. Based on this information, which of the following was most likely?

(A) Water in the contaminated ponds moved more slowly than the water in the healthy ponds.

(B) Water in the healthy ponds moved more slowly than the water in the contaminated ponds.

(C) Water in the two pond types moved at about the same speed.

(D) The water depth of the contaminated ponds was greater than the water depth of the healthy ponds.

30. Experiment 2 differed from Experiment 1 in that the scientists:

(F) tested fewer ponds in Experiment 1 than they did in Experiment 2.

(G) averaged results in Experiment 1 but did not average results in Experiment 2.

(H) tested for the presence of a gas in Experiment 1 but not in Experiment 2.

(J) did not test for the presence of a gas in Experiment 1 but did in Experiment 2.

Passage VI

A wave is an oscillation that occurs through matter or space. A wave consists of many characteristics that define it. The wavelength (λ) is the distance between two crests or two troughs as shown in Figure 1. The period (T) is the time it takes a wave to complete one oscillation. The frequency (v) is the number of periods per unit time, measured in hertz (Hz). The wave velocity (c) is the distance traveled in a period per unit time. The period of the wave completely defines its frequency, and vice versa. The following equations are used to determine wave period and velocity.

$$T = 1/\upsilon$$
$$c = \lambda / T$$

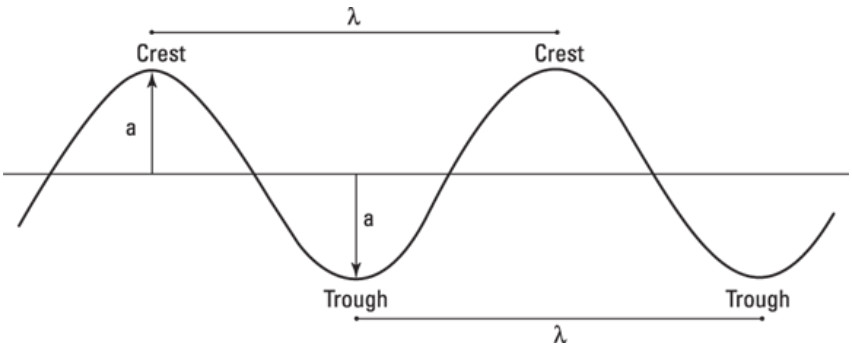


FIGURE 1

Oceanographers took 265 days' worth of data for deep-water waves in three bodies of water off the coast of the United States: the Atlantic Ocean, Pacific Ocean, and Gulf of Mexico. Table 1 charts the average wavelength and velocity for each body of water.

TABLE 1

	Velocity (c) in m/s	*Wavelength (λ) in m*	*Frequency (v) in Hz*
Atlantic Ocean	0.95	425	0.0022
Pacific Ocean	0.95	625	0.0015
Gulf of Mexico	0.86	650	0.0013

31. Compared to the average period (T) for a wave in the Pacific Ocean, the average period (T) for a wave in the Atlantic Ocean would likely be:

(A) the same, because the average velocity of waves in the Atlantic Ocean is the same as the average velocity of waves in the Pacific Ocean and the average wavelengths in both oceans are different.

(B) the same, because the average wavelength of waves in the Atlantic Ocean is the same as the average wavelength of waves in the Pacific Ocean and the average velocities of waves in both oceans are different.

(C) different, because the average wavelength of waves in the Atlantic Ocean is different from the average wavelength of waves in the Pacific Ocean and the average velocities of waves in both oceans is the same.

(D) different, because the average velocity of waves in the Atlantic Ocean is different from the average velocity of waves in the Pacific Ocean

32. According to information in the passage, which of the studied bodies of water most likely has the greatest average wave period (*T*)?

(F) The Atlantic Ocean has the greatest average period.

(G) The Pacific Ocean has the greatest average period.

(H) The Gulf of Mexico has the greatest average period.

(J) Both the Atlantic and Pacific Oceans have greater average periods than the Gulf of Mexico.

33. The frequency of a wave cycle in the deeper waters of another large body of water was found to be 0.0075 m/s. Based on information in the passage, its wavelength is most likely:

(A) less than 425 m.

(B) between 425 and 625 m.

(C) between 625 and 650 m.

(D) greater than 650 m.

34. The amplitude (*a*) is the distance from the wave's centerline to its crest or trough. Based on information in the passage, which of the three bodies of water had the greatest average wave amplitude?

(F) Atlantic Ocean

(G) Pacific Ocean

(H) Gulf of Mexico

(J) The passage does not provide sufficient information to determine the greatest average wave amplitude.

35. For all tested bodies of water, as wavelength increased, frequency:

(A) decreased only.

(B) increased only.

(C) generally stayed the same.

(D) decreased then increased.

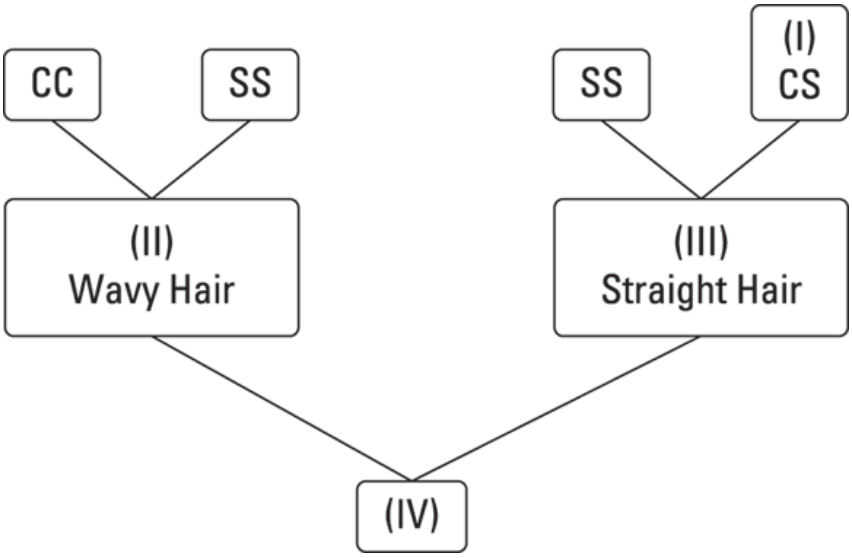
Passage VII

Specific genes are responsible for producing particular traits in an organism. In complex organisms, offspring inherit a combination of genes from two distinct parents. Offspring receive two alleles for each trait — one from one parent and one from the other.

The genetic makeup of an individual, determined by the two alleles they inherit for a given trait, is known as their genotype. The way these traits are physically expressed is referred to as the phenotype. In many cases, one allele is dominant over another recessive allele. This means that the dominant allele's trait is the one that appears in the phenotype, even though the individual also carries the recessive allele. However, in instances of incomplete dominance, the combination of alleles leads to a phenotype that is distinct from either of the individual allele traits.

In a certain population of humans, there are two alleles that determine hair texture. The C allele codes for curly hair, while the S allele codes for straight hair. In this case, the trait for hair type follows a pattern of incomplete dominance. Individuals who inherit two C alleles (CC) have curly hair, while those with two S alleles (SS) have straight hair. The figure below illustrates a family tree

that outlines some of the observed genotypes and phenotypes, with lines indicating the relationships between parents and their offspring.



36. The hair texture of Individual I must be:

(F) curly.

(G) straight.

(H) the same as that for Individual IV.

(J) wavy.

37. What are the percent chances that Individual IV will have the same hair texture as Individual I?

(A) 0

(B) 25

(C) 50

(D) 100

38. The genotype of offspring of Individual III and an individual with curly hair could be:

(F) CS only.

(G) either CC, CS, or SS.

(H) wavy only.

(J) either curly or straight.

39. What percent of the offspring of Individual III and an individual with the same genotype would have curly hair?

(A) 0

(B) 25

(C) 50

(D) 100

40. Individual III and an individual with the genotype CC produce six offspring. How many of their offspring will possess a different hair texture from that of their parents?

(F) 0

(G) 2

(H) 4

(J) 6

Writing Test

TIME: 40 minutes

DIRECTIONS: Respond to the following prompt with a well-organized essay that follows the rules of Standard English. Write your essay on a separate sheet of lined paper.

Some people believe that the elderly population should be required to reapply for a driver's license and retake a driving test after they reach a particular age. As the Baby Boomer generation ages, more and more elderly drivers are taking to the roadways, and with the aging process comes a variety of issues that can lead to problems behind the wheel. Hearing loss, diminished vision, and longer reaction times are just a few of these possible concerns. Is it fair to force an entire population to reapply for something they have already earned and been using for decades? Given the increasing number of elderly drivers on the road, this is an important issue worthy of careful consideration.

Read and carefully consider these perspectives. Each suggests a particular way of thinking about whether elderly drivers should have to reapply for a driver's license once they reach a certain age.

Perspective 1: Elderly drivers should have to retake their driving tests once they reach a particular age for both their own safety and that of all others out on the roadways. Certain abilities decrease with age, and many of those abilities that do decrease are critical for maintaining safe driving practices.

Perspective 2: Forcing elderly drivers to retake their driving tests based on age rather than a demonstrated lack of ability behind the wheel is essentially a form of age discrimination and should not be put into practice.

Perspective 3: Requiring all elderly drivers to reapply for driver's licenses after they reach a given age puts an unnecessary strain on already limited resources in our DMVs and driving schools, and it would take attention away from the inexperienced teen population that is learning the rules of the road for the first time.

Essay Task

Write a unified, coherent essay in which you evaluate multiple perspectives as to whether elderly drivers should be forced to reapply for a driver's license once they reach a given age. In your essay, be sure to:

- Clearly state your own perspective on the issue and analyze the relationship between your perspective and at least one other perspective.
- Develop and support your ideas with reasoning and examples.
- Organize your ideas clearly and logically.
- Communicate your ideas effectively in standard written English.

Your perspective may be in full agreement with any of the others, in partial agreement, or wholly different.