FULL-LENGTH PRACTICE TESTS 8 - ANSWERS AND EXPLANATIONS

English

TIME: 35 Minutes—50 Questions

DIRECTIONS: In the five passages that follow, certain words and phrases are underlined and numbered. In the answer choices, you will find alternatives for each underlined part. Choose the best alternative, or select "NO CHANGE" if the original version is correct.

You will also find questions preceded by numbers in brackets [like this]. These questions ask about a section of the passage or the passage as a whole, such as organization, adding or deleting sentences, or overall effectiveness. These questions do not refer to a bolded portion.

For each question, choose the best answer and fill in the corresponding oval on your answer document.

Important: Read each complete passage before answering its questions. Many questions require you to read several sentences beyond the question to determine the correct answer.

PASSAGE I

The Community Garden Revival

When our neighborhood's old community garden had fallen (1) into disrepair, most residents assumed it was gone for good. The plot had been abandoned for nearly five years, weeds (2) had overtaken what were once carefully tended vegetable beds. The fence was rusting, the tool shed had collapsed, and (3) the water system no longer functioned.

However my neighbor (4) Mrs. Chen saw potential where others saw only decay. She began by simply showing up on Saturday mornings with gardening tools, she (6) pulled weeds and cleared debris. At first she worked alone but (7) within a few weeks, other neighbors began to join her.

The transformation didn't happen overnight but it (8) did happen steadily. We formed a committee to manage the garden and dividing (9) the plots among interested families. Each family who signed up, received (10) a 10-by-10-foot plot and agreed to maintain it throughout the growing season.

By midsummer the garden was thriving. (11) Tomatoes climbed their stakes, beans wound around poles, and herbs release their (12) fragrance in the morning sun. More importantly the garden became a gathering place where neighbors who had lived on the same street for years finally got to know each other. (13)

1. Which choice best maintains the past tense established in the passage?

A. had been falling

B. fell

C. has fallen

D. falls

2. What is the best way to punctuate this portion of the passage?

F. NO CHANGE

G. years, and weeds

H. years. Weeds

J. years; weeds

3. Which word or phrase best connects these parallel elements?

A. and also

B. and, furthermore,

C. and

D. and then

4. What is the correct punctuation after "However"?

F. However; my neighbor

G. However, my neighbor

H. However: my neighbor

J. However my neighbor

5. Given that all choices are true, which provides the most effective opening to this sentence?

A. Mrs. Chen saw potential where others saw only decay.

B. Mrs. Chen had gardening experience from her childhood.

C. Mrs. Chen was older than most of the other neighbors.

D. Mrs. Chen lived closest to the abandoned garden.

6. Which choice correctly combines these clauses?

F. tools, and she

G. tools; she

H. tools, she

J. tools. She

7. What is the best punctuation for this portion of the sentence?

A. alone, but

B. alone; but

C. alone, but

D. alone but

8. Which punctuation correctly joins these independent clauses?

F. overnight, but, it

G. overnight, but it

H. overnight but it

J. overnight; but, it

9. Which verb form maintains parallel structure with "formed"?

A. divided

B. dividing

C. to divide

D. and dividing

10. What is the correct punctuation in this sentence?

F. up received

G. up; received

H. up, received

J. up received

11. Which choice provides the most effective transition to this paragraph?

A. The garden was doing well by summer.

B. Many vegetables were planted in the spring.

C. By midsummer, the garden was thriving.

D. Summer is the best time for gardens.

12. Which verb tense correctly maintains consistency with the passage?

F. release their

G. releasing their

H. released their

J. were releasing their

13. Given that all choices are grammatically correct, which most effectively concludes the passage by emphasizing the garden's broader impact?

A. More importantly, the garden became a gathering place where neighbors who had lived on the same street for years finally got to know each other.

B. The garden produced many pounds of vegetables that summer.

C. Mrs. Chen felt proud of what the community had accomplished.

D. Everyone learned new gardening techniques from each other.

PASSAGE II

The Science of Sourdough Bread

For thousands of years, humans have been baking bread using wild yeast and bacteria instead, of commercial yeast. (14) This ancient technique, known as sourdough fermentation, create (15) bread with a distinctive tangy flavor and chewy texture that mass-produced bread cannot replicate.

The process begins with a "starter": a mixture of flour and water that has been left to ferment, wild (16) yeast and bacteria from the environment colonizes (17) the mixture, feeding on the flour's sugars and producing carbon dioxide and lactic acid. The carbon dioxide, creates (18) bubbles that make the bread rise, while the lactic acid gives sourdough its characteristic sour taste.

Maintaining a sourdough starter, requires (19) regular feeding. Bakers must add fresh flour and water to their (20) starter every few days, discarding a portion to prevent it from growing too large, this (22) process keeps the yeast and bacteria populations healthy and active. Some bakers maintain starters that have been continuously fed for decades, passing (23) them down through generations like family heirlooms, these (24) starters develop unique flavor profiles based on their local microbial communities. [25]

14. What is the correct punctuation for this phrase?

F. NO CHANGE

G. instead of, commercial yeast.

H. instead of commercial yeast.

J. instead of commercial yeast,

15. Which verb form agrees with the singular subject "technique"?

A. creating

B. creates

C. create

D. are creating

16. Which punctuation correctly connects these two clauses?

F. ferment wild

G. ferment; wild

H. ferment, wild

J. ferment. Wild

17. Which verb form agrees with the plural compound subject "yeast and bacteria"?

A. colonizes

B. has colonized

C. colonize

D. colonizing

18. What is the correct punctuation after "dioxide"?

F. NO CHANGE

G. dioxide creates

H. dioxide; creates

J. dioxide: creates

19. Which verb form correctly follows the subject?

A. requires

B. require

C. requiring

D. to require

20. What is the correct punctuation after "starter"?

F. starter, requires

G. starter: requires

H. starter; requires

J. starter requires

21. Which pronoun correctly refers to "bakers"?

A. their

B. his or her

C. its

D. one's

22. Which punctuation correctly connects these clauses?

F. large, this

G. large. This

H. large; this

J. large this

23. Which verb form maintains proper structure in this sentence?

A. decades passing

B. decades, passing

C. decades. Passing

D. decades; passing

24. Which punctuation correctly connects these related ideas?

F. heirlooms, these

G. heirlooms these

H. heirlooms. These

J. heirlooms; these

25. Suppose the writer's goal had been to write an essay explaining the detailed chemical processes involved in sourdough fermentation. Would this essay successfully accomplish that goal?

A. Yes, because it thoroughly explains all chemical reactions in fermentation.

B. Yes, because it mentions carbon dioxide and lactic acid production.

C. No, because it focuses more on the practice of maintaining starters than on detailed chemical processes.

D. No, because it doesn't mention any chemical processes at all.

PASSAGE III

Bioluminescence in the Deep Sea

In the perpetual darkness of the deep ocean, where sunlight cannot penetrate many (26) creatures have evolved the ability to produce their own light. This phenomenon, called bioluminescence, occur (27) when chemical reactions within an organism's cells produce light energy scientists (28) estimate that more than 90 percent of deep-sea animals possess bioluminescent capabilities, the (29) ability serves multiple purposes: attracting prey communicating (30) with potential mates, and confusing predators. The anglerfish, for example uses (31) a glowing lure that dangles in front of its mouth, attracting curious fish directly into its jaws.

Other deep-sea creatures use bioluminescence defensively when (32) threatened, the vampire squid releases clouds of glowing mucus that distract predators while it escapes into the darkness. This strategy, called a "bioluminescent burglar alarm," actually attracts larger predators to the area, which (33) may attack the vampire squid's pursuer instead.

The chemical mechanism behind bioluminescence involves a light-emitting molecule called luciferin and an enzyme called luciferase when (34) these substances interact in (35) the presence of oxygen, they produce light with remarkably little heat. This "cold light" is far more efficient than artificial lighting which (36) wastes most of its energy as heat.

Researching bioluminescence has practical applications. (37) Scientists are developing medical imaging techniques that use bioluminescent markers to track (38) diseases, and engineers are exploring ways to create more efficient lighting systems based on biological light production.

26. What is the correct punctuation between these clauses?

F. penetrate, many

G. penetrate; many

H. penetrate: many

J. penetrate many

27. Which verb form agrees with the singular subject "phenomenon"?

A. occur

B. occurring

C. occurs

D. have occurred

28. What is the correct punctuation after "energy"?

F. energy scientists

G. energy, scientists

H. energy. Scientists

J. energy; scientists

29. Which punctuation correctly connects these sentences?

A. capabilities, the

B. capabilities the

C. capabilities; the

D. capabilities. The

30. What is the correct punctuation before the second item in this list?

F. prey communicating

G. prey, communicating

H. prey; communicating

J. prey: communicating

31. What is the correct punctuation after "example"?

A. example uses

B. example, uses

C. example; uses

D. example: uses

32. What is the best way to structure this sentence?

F. NO CHANGE

G. defensively. When

H. defensively, when

J. defensively; when

33. Which punctuation correctly sets off the relative clause?

A. area, which,

B. area which,

C. area; which

D. area, which

34. What is the correct punctuation between these elements?

F. luciferase when

G. luciferase. When

H. luciferase; when

J. luciferase, when

35. Which verb maintains the clearest meaning?

A. interact with

B. interact in

C. react in

D. combine in

36. What is the correct punctuation before "which"?

F. lighting, which

G. lighting; which

H. lighting which

J. lighting: which

37. Which choice provides the most effective transition to this paragraph about practical applications?

A. Bioluminescence is studied by many scientists.

B. Many scientists find bioluminescence interesting.

C. Research into bioluminescence has practical applications.

D. Practical applications of bioluminescence exist.

38. What is the correct form of this phrase?

F. markers, to track

G. markers to track

H. markers; to track

J. markers: to track

PASSAGE IV

The Rise of Community Refrigerators

In cities across the country, a new approach to fighting food waste and hunger has been appearing community (39) refrigerators placed in public spaces where anyone can take or leave food these (40) grassroots initiatives operate on a simple principle: those (41) who have extra food can share it, and those who need food can take it, no questions asked. The refrigerators (42) are stocked by local restaurants, grocery stores, and individual donors who want to prevent usable food from going to waste.

Unlike traditional food banks, which often require registration and have limited hours community (43) refrigerators are accessible 24/7. This accessibility is particularly important for people who work nontraditional hours or who may feel uncomfortable seeking help through formal channels furthermore (44) the movement faces challenges. (45) Maintaining food safety requires (46) regular cleaning and temperature monitoring. Organizers must also navigate health department regulations, which vary by location and sometimes prohibit sharing certain types of food despite (47) these obstacles, hundreds of community refrigerators now operate nationwide, serving thousands of people.

Critics questioned (48) whether unsupervised food sharing is safe, but proponents point to the community's self-regulation most (49) refrigerators are monitored by local volunteers who check expiration dates and remove questionable items, and users generally respect the shared resource. (50)

39. What is the correct punctuation after "appearing"?

A. appearing community

B. appearing: community

C. appearing; community

D. appearing, community

40. What is the correct punctuation after "food"?

F. food these

G. food. These

H. food, these

J. food; these

41. What is the correct punctuation after "principle"?

A. principle, those

B. principle; those

C. principle: those

D. principle those

42. Which pronoun correctly refers to "refrigerators"?

F. The refrigerators

G. The refrigerator

H. It

J. They

43. What is the correct punctuation in this sentence?

A. hours community

B. hours, community

C. hours; community

D. hours, community

44. Which punctuation and word choice creates the most effective transition?

F. channels furthermore

G. channels. Furthermore,

H. channels, furthermore

J. channels; furthermore

45. Which choice most effectively introduces this paragraph about challenges?

A. There are challenges.

B. The movement faces challenges.

C. Challenges exist in the movement.

D. Some challenges have appeared.

46. Which verb form is correct?

F. requires

G. require

H. requiring

J. to require

47. Which punctuation correctly introduces the contrasting clause?

A. food despite

B. food, despite

C. food; despite

D. food. Despite

48. Which verb tense maintains consistency with the passage?

F. questioned

G. question

H. are questioning

J. will question

49. What is the correct punctuation after "self-regulation"?

A. self-regulation most

B. self-regulation. Most

C. self-regulation, most

D. self-regulation; most

50. If the writer were to delete the underlined portion, the passage would primarily lose:

F. specific details about how food safety is maintained through community monitoring.

G. unnecessary information about volunteers.

H. a repetition of information stated earlier.

J. details that contradict the passage's main argument.

Mathematics

TIME: 50 minutes for 45 questions

DIRECTIONS: Each question has four answer choices. Choose the best answer for each question and shade the corresponding oval on your answer sheet.

1. What is the value of $3x + 7$ when $x = 5$?

A. 18

B. 20

C. 22

D. 25

2. A shirt originally priced at $45 is marked down by 20%. What is the sale price in dollars?

A. $25

B. $36

C. $40

D. $43

3. If $4x - 8 = 20$, what is the value of x?

A. 3

B. 5

C. 6

D. 7

4. What is the slope of the line passing through points (2, 5) and (6, 13)?

A. 2

B. 4

C. 8

D. 11

5. In the equation $y = 3x - 4$, what is the y-intercept?

A. 3

B. -3

C. -4

D. 4

6. What is 35% of 80?

A. 24

B. 28

C. 32

D. 35

7. A rectangle has a length of 12 inches and a width of 5 inches. What is its area in square inches?

A. 17

B. 34

C. 50

D. 60

8. If $f(x) = 2x^2 - 3$, what is $f(4)$?

A. 29

B. 32

C. 35

D. 38

9. What is the value of $\sqrt{81} + \sqrt{16}$?

A. 11

B. 12

C. 13

D. 14

10. In a bag of 50 marbles, 15 are red, 20 are blue, and 15 are green. What is the probability of randomly selecting a blue marble?

A. 3/10

B. 2/5

C. 1/2

D. 3/5

11. If $5x + 3y = 27$ and $x = 3$, what is the value of y?

A. 2

B. 3

C. 3

D. 4

12. What is the distance between points (-1, 2) and (3, 5) on the coordinate plane?

A. 5

B. 6

C. 7

D. 8

13. Which expression is equivalent to $(x + 4)(x - 2)$?

A. $x^2 + 2x - 6$

B. $x^2 - 2x - 8$

C. $x^2 + 2x - 8$

D. $x^2 + 6x - 8$

14. A circle has a diameter of 14 centimeters. What is its radius in centimeters?

A. 3.5

B. 7

C. 14

D. 28

15. If $2x - 5 > 11$, which inequality represents all possible values of x?

A. $x > 3$

B. $x > 6$

C. $x > 7$

D. $x > 8$

16. What is the median of the following set of numbers: 12, 8, 15, 10, 8, 20?

A. 11

B. 12

C. 13

D. 15

17. If $a = -3$, what is the value of $a^2 + 2a - 5$?

A. -8

B. -3

C. -2

D. 4

18. A triangle has angles measuring 45°, 65°, and x°. What is the value of x?

A. 60

B. 70

C. 75

D. 80

19. What is the value of 4^3?

A. 12

B. 16

C. 48

D. 64

20. If $3(x + 2) = 18$, what is the value of x?

A. 4

B. 5

C. 6

D. 8

21. What is the perimeter of a square with side length 9 meters?

A. 18 m

B. 27 m

C. 36 m

D. 81 m

22. Which of the following is equivalent to $5x - 2x + 7x$?

A. 9x

B. 10x

C. 12x

D. 14x

23. If y varies directly with x, and $y = 15$ when $x = 3$, what is y when $x = 8$?

A. 30

B. 35

C. 38

D. 40

24. What is the area of a circle with radius 4 inches? (Use $\pi \approx 3.14$)

A. 50.24 in^2

B. 25.12 in^2

C. 12.56 in^2

D. 100.48 in^2

25. If $|2x - 4| = 10$, what are all possible values of x?

A. -3 and 7

B. -7 and 3

C. -3 and 7

D. 3 and 7

26. A car travels 240 miles in 4 hours. What is the average speed in miles per hour?

A. 40 mph

B. 60 mph

C. 80 mph

D. 96 mph

27. What is the value of $\sin(30°)$?

A. $\sqrt{3}/2$

B. $\sqrt{2}/2$

C. 1

D. 1/2

28. If the sides of a right triangle are 6, 8, and 10, what is the length of the hypotenuse?

A. 10

B. 8

C. 6

D. 14

29. Which expression is equivalent to $3(2x + 5) - 4$?

A. $6x + 11$

B. $6x + 15$

C. $6x + 11$

D. $6x + 19$

30. What is the value of $\log_2(32)$?

A. 4

B. 5

C. 6

D. 16

31. A cube has edges of length 3 centimeters. What is its volume in cubic centimeters?

A. 9

B. 18

C. 24

D. 27

32. If $f(x) = x^2 - 5x + 6$, what is $f(0)$?

A. 6

B. 5

C. 1

D. 0

33. What is the sum of the interior angles of a hexagon?

A. 540°

B. 710°

C. 720°

D. 1080°

34. Which equation represents a line perpendicular to $y = 2x + 3$?

A. $y = 2x - 1$

B. $y = -\frac{1}{2}x + 4$

C. $y = \frac{1}{2}x + 2$

D. $y = -2x + 1$

35. If $3^x = 81$, what is the value of x?

A. 3

B. 27

C. 9

D. 4

36. What is the value of cos(60°)?

A. 1/2

B. √3/2

C. √2/2

D. 1

37. A rectangular prism has dimensions 4 cm × 5 cm × 6 cm. What is its volume in cubic centimeters?

A. 15

B. 60

C. 120

D. 150

38. If a sequence follows the pattern 5, 10, 20, 40, ..., what is the 6th term?

A. 60

B. 160

C. 80

D. 320

39. What is the slope of a line perpendicular to a line with slope 3?

A. 3

B. -3

C. ⅓

D. -⅓

40. If $2x + 3y = 18$ and $x = 6$, what is the value of y?

A. 2

B. 3

C. 4

D. 6

41. What is the midpoint of the line segment connecting (-2, 4) and (6, 10)?

A. (4, 7)

B. (2, 6)

C. (2, 7)

D. (4, 6)

42. A cylinder has a radius of 3 inches and a height of 8 inches. What is its volume in cubic inches? (Use $\pi \approx 3.14$)

A. 75.36

B. 226.08

C. 150.72

D. 301.44

43. If $x^2 - 9x + 20 = 0$, what are the solutions for x?

A. 2 and 10

B. 3 and 7

C. 4 and 6

D. 4 and 5

44. What is the value of tan(45°)?

A. 1

B. √2/2

C. √3/2

D. 2

45. A line passes through point (3, -2) with slope 4. What is the equation of this line in slope-intercept form?

A. $y = 4x + 10$

B. $y = 4x - 2$

C. $y = 4x - 14$

D. $y = 4x + 14$

Reading

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 a contemporary novel about a young woman returning to her childhood home.

The key turned stiffly in the lock, resisting my efforts the way the house itself seemed to resist my return. I hadn't been back to my grandmother's house in fifteen years—not since her funeral, not since the day I'd sworn to myself that I was done with this place, done with the memories that clung to every room like cobwebs in the corners.

But here I was, at thirty-two, standing in the doorway with a set of keys my mother had mailed me last month. "You should be the one to clear it out," she'd written in her careful script. "You were always her favorite." The words had stung more than she'd probably intended. My sister Rachel had been the one who visited every summer, who called every Sunday, who remembered birthdays without being reminded. But Grandma had left the house to me.

The air inside smelled of dust and something else—lavender, maybe, or the ghost of lavender. Grandma had kept sachets in every drawer, little purple bundles that she refreshed each spring with flowers from her garden. I wondered if any remained, hidden away in dresser drawers I'd have to sort through, their fragrance faded but still recognizable.

I set my bag down in the entry hall and forced myself to walk through the rooms I'd once known by heart. The living room looked smaller than I remembered, the floral sofa more worn. The piano in the corner—an upright Steinway that Grandma had bought used from a church—still held the same crack in its mahogany case, still wore the same water ring on its top from the time I'd left a glass there after practicing scales.

My guilt about that water ring had lasted for weeks. I must have been nine or ten, old enough to know better but young enough to hope the damage might magically disappear if I simply didn't mention it. Grandma had never said a word about it. Years later, when I was in high school, I'd asked her why she hadn't been angry. "It's just a piano," she'd said, in the practical way she had of diminishing catastrophes. "We could refinish it, or we could leave it as evidence that you were here. **I prefer the evidence."**

The kitchen drew me in the way it always had. This was where Grandma and I had spent most of our time together during those summers when my parents would drop Rachel and me off for what they called "cultural enrichment" and what we understood to be a chance for them to take vacations without children underfoot. Rachel would spend her days reading in the garden or exploring the woods behind the house. I would plant myself at the kitchen table and watch Grandma work.

She cooked the way some people practiced meditation—with complete attention, no wasted motion, everything in its place. She could bone a chicken in under a minute, her knife moving with such confidence that I never once saw her nick herself. She would peel potatoes in a single spiraling ribbon, the skin falling away in one unbroken curl. And she talked while she worked, telling me stories about her own childhood, about the restaurant her parents had owned, about the year she'd spent in Paris learning from a chef whose name I could never quite pronounce.

"Cooking is translation," she'd told me once, her hands deep in bread dough, kneading with a rhythm that seemed almost hypnotic. "You take ingredients—basic things, flour and water and salt—and you translate them into something else. You translate hunger into satisfaction, translate loneliness into community. Every meal is a conversation."

I'd loved those summers until I was fourteen, the summer everything changed. The summer I discovered that Grandma, who had seemed so self-sufficient and content in her solitary life, had once been engaged to a man who'd died in the war before they could marry. I found the letters in the attic, tied with blue ribbon, written in handwriting I didn't recognize. They were love letters, intimate and longing, addressed to "My darling Eleanor."

When I'd confronted Grandma about them, she'd been standing right here at this stove, stirring a pot of soup. She'd turned off the burner, wiped her hands on her apron, and told me the whole story in a voice so matter-of-fact that it had somehow made the tragedy worse. Yes, she'd loved him. Yes, she'd planned to marry him. Yes, he'd died, and yes, she'd mourned him. "But that was a long time ago," she'd said. "I built a different life than the one I'd planned. A good life."

"But weren't you lonely?" I'd asked, teenage romanticism making me see tragedy where she saw simple acceptance.

"Sometimes," she'd admitted. "But lonely isn't the same as alone. I had my work, my home, my garden. I had you girls in the summers. I had a life full of things I'd chosen." She'd paused then, studying my face. "You think I'm tragic, don't you? A woman alone, living with memories. But you've got it wrong. **I'm not living with memories. I'm living with choices."**

That conversation had stayed with me, though I hadn't fully understood it then. I'd gone home at the end of that summer and somehow never managed to come back. College, then graduate school, then the years of building my career, of moving from city to city, of telling myself I was too busy for visits that weren't absolutely necessary. I'd called on holidays. I'd sent cards. But I hadn't come back.

Now, standing in her kitchen, I understood something I'd been too young and too self-absorbed to see before. Grandma hadn't needed me to visit. She'd wanted it—I believed that—but she hadn't needed it because she'd built a life that was complete on its own terms. She hadn't been waiting for someone to rescue her from solitude. She'd been living.

I opened the refrigerator, empty except for a box of baking soda, and found myself crying for the first time since getting the news of her death. Not crying for her—she'd lived ninety-three years and died peacefully in her sleep, and she'd have called it greedy to want more than that. I was crying for myself, for all the summers I'd missed, for all the conversations I'd been too proud or too busy to have, for the translation lessons I'd failed to learn.

But as I stood there in the empty kitchen, I realized something else. The house wasn't resisting my return. It was waiting. Waiting to see what I would translate all of this into—the memories, the regret, the love that had persisted despite my long absence. Waiting to see what choices I would make now that I finally understood the difference between living with memories and living with choices.

1. The narrator's initial reaction to entering the house is best characterized as:

A. eager anticipation mixed with curiosity.

B. reluctance mixed with obligation.

C. overwhelming sadness and grief.

D. anger at being forced to return.

2. According to the passage, why did the narrator's mother suggest that the narrator should clear out the house?

F. The narrator was the only family member living nearby.

G. The narrator had been the grandmother's favorite.

H. Rachel was too emotionally attached to handle the task.

J. The narrator had previously expressed interest in the house.

3. The narrator's guilt about the water ring on the piano primarily serves to illustrate:

A. the narrator's careless nature as a child.

B. the tension between the narrator and her grandmother.

C. a memory of the grandmother's forgiveness and acceptance.

D. the reason the narrator stopped visiting her grandmother.

4. The grandmother's statement "I prefer the evidence" suggests that she:

F. valued the piano more than she let on.

G. was secretly angry about the damage.

H. cherished signs of her granddaughter's presence.

J. planned to refinish the piano eventually.

5. Based on the passage, the primary difference between the narrator and Rachel during their childhood summers was that:

A. the narrator spent time with their grandmother in the kitchen while Rachel preferred solitude.

B. Rachel was more rebellious while the narrator was obedient.

C. the narrator was interested in cooking while Rachel preferred gardening.

D. Rachel visited more frequently during the school year.

6. The grandmother's statement that "Cooking is translation" most directly suggests that cooking:

F. requires knowledge of foreign languages.

G. is a form of communication requiring precision.

H. can only be learned through formal training.

J. transforms basic elements into meaningful experiences.

7. The narrator's discovery of the love letters at age fourteen affected her relationship with her grandmother by:

A. strengthening their bond through shared vulnerability.

B. helping the narrator understand her grandmother's cooking expertise.

C. causing the narrator to see her grandmother as more traditional.

D. creating a new perception that contributed to the narrator's distance.

8. When the grandmother said "I'm not living with memories. I'm living with choices", she was primarily emphasizing:

F. her active engagement with life rather than passive nostalgia.

G. her regret about not marrying her fiancé.

H. her disappointment with her granddaughter's questions.

J. her belief that memories are unimportant.

9. The narrator's tears in the kitchen are prompted by:

A. grief over her grandmother's death.

B. regret over missed opportunities and conversations.

C. anger at herself for being too busy.

D. relief that her obligation to visit is finally over.

PASSAGE II — SOCIAL SCIENCE

This passage is adapted from an article about the psychology of procrastination.

Procrastination is often viewed as a failure of willpower, a character flaw that reflects poor time management or simple laziness. However, recent psychological research reveals that procrastination is far more complex—and more universal—than this moral framework suggests. Understanding procrastination as an emotional regulation problem rather than a time management problem offers new insights into why we delay tasks and how we might address this remarkably common human behavior.

Studies estimate that between 15% and 20% of adults are chronic procrastinators, meaning they consistently delay tasks across multiple life domains. But nearly everyone procrastinates at least occasionally, particularly on tasks that are aversive, ambiguous, or lacking in immediate rewards. This widespread nature of procrastination suggests it's not simply a matter of character weakness but rather a fundamental challenge in how humans navigate the temporal landscape—how we make decisions when immediate costs must be weighed against delayed benefits.

Dr. Timothy Pychyl, a researcher at Carleton University who has studied procrastination for over two decades, argues that procrastination is fundamentally about emotion regulation. When we face a task, we don't just evaluate its importance or urgency. We also have an immediate emotional reaction to it. That statistics homework might trigger anxiety about math skills. That difficult conversation might spark anticipatory dread. That creative project might activate fear of judgment or perfectionism. Procrastination, from this perspective, is a way of avoiding these negative emotions in the present moment, even though we know rationally that delaying will create worse consequences later.

This explains one of procrastination's most puzzling features: we often procrastinate even when we know we're making things worse for ourselves. The student who delays starting a paper until the night before it's due isn't unaware that this strategy creates unnecessary stress and likely produces lower-quality work. But in the moment of decision, the immediate relief from anxiety outweighs the abstract future cost. Procrastination provides temporary mood repair—a brief escape from unpleasant emotions—at the expense of long-term well-being.

Brain imaging studies support this emotion-focused theory. Research using fMRI technology shows that when people contemplate tasks they're inclined to delay, they show heightened activity in the amygdala, the brain's threat-detection center, and reduced activity in the prefrontal cortex regions associated with impulse control and long-term planning. The task triggers an emotional threat response, and the prefrontal cortex's ability to override that response weakens. Procrastination, in this neurological view, is a failure not of time management but of emotional management.

This understanding has important implications for how we think about procrastination. Traditional advice focuses on external structures: break tasks into smaller pieces, use timers, create deadlines, eliminate distractions. While these strategies can help, they treat procrastination as primarily a logistical problem. If procrastination is fundamentally emotional, then lasting solutions must address the emotional dimension.

Dr. Fuschia Sirois, a researcher at the University of Sheffield, has found that self-compassion—treating oneself with kindness rather than harsh self-criticism—can reduce procrastination. This might seem counterintuitive; wouldn't being harder on ourselves motivate us to stop delaying? But self-criticism tends to increase the negative emotions that drive procrastination. Feeling ashamed or guilty about procrastinating often leads to more procrastination as people seek to escape these uncomfortable feelings. Self-compassion, by contrast, reduces the emotional intensity of confronting our delayed tasks, making it easier to begin.

Another promising approach involves what psychologists call "temporal discounting"—the tendency to value immediate rewards more heavily than future rewards. Procrastinators show particularly steep temporal discounting; the future seems abstract and distant while present discomfort feels vivid and real. Interventions that help people connect more vividly with their future selves—visualizing the specific consequences of delay, writing letters to one's future self, imagining the relief of completing a task—can reduce procrastination by making future outcomes feel more present and real.

Importantly, not all delay is procrastination. Intentional delay can be a form of strategic prioritization. If you postpone one task to complete something more urgent or important, that's effective time management, not procrastination. The key distinction is whether the delay is purposeful or driven by avoidance. Procrastination involves knowing you should do something, wanting to do it, but finding yourself unable to begin despite the absence of external barriers. It's the gap between intention and action, motivated by an emotional impulse toward short-term mood repair.

Cultural factors also shape procrastination patterns. Research suggests that procrastination rates are highest in individualistic cultures like the United States and Western Europe, and lower in more collectivist cultures. This difference might relate to how tasks are framed. In individualistic cultures, tasks are often

seen as personal responsibilities; failure to complete them reflects on individual competence, triggering more anxiety and avoidance. In collectivist cultures, tasks might be framed more as contributions to group goals, potentially reducing the individual emotional burden.

However, modern technology may be equalizing these cultural differences. The internet provides unprecedented opportunities for procrastination through immediate, emotionally rewarding distractions. Social media, video streaming, games—all offer mood-lifting experiences that require minimal effort. Research shows that internet access correlates with increased procrastination rates across cultures, suggesting that technological access to easy pleasure may overwhelm cultural differences in how we approach work.

The study of procrastination reveals something fundamental about human nature: we are not perfectly rational agents optimizing our long-term interests. We are emotional beings navigating the complicated terrain of immediate feelings and distant goals. Procrastination persists because it works—briefly. It provides real relief from real discomfort. The challenge lies in developing emotional awareness and regulation strategies that address the roots of delay rather than just managing its symptoms.

Understanding procrastination as emotional rather than simply behavioral opens new possibilities for addressing it. Rather than berating ourselves for weakness or forcing ourselves through rigid systems, we might ask: What emotion is this task triggering? How can I make the present cost feel more manageable? How can I connect more meaningfully with my future self who will deal with the consequences of delay? These questions shift procrastination from a moral failing to a solvable psychological challenge—one that affects nearly all of us at some point in our lives.

10. According to the passage, the traditional view of procrastination characterizes it as:

F. an emotional regulation problem affecting most adults.

G. a complex psychological phenomenon requiring research.

H. a character flaw involving poor willpower and laziness.

J. a rational strategy for avoiding difficult tasks.

11. The passage indicates that between 15% and 20% of adults are:

A. occasional procrastinators who delay only certain tasks.

B. people who never procrastinate under any circumstances.

C. chronic procrastinators who consistently delay across life domains.

D. individuals who procrastinate only on aversive tasks.

12. According to Dr. Timothy Pychyl's research, procrastination is fundamentally about:

F. regulating negative emotions triggered by tasks.

G. managing time more efficiently across multiple projects.

H. lacking the discipline to complete important work.

J. avoiding tasks that lack immediate rewards.

13. The passage suggests that people procrastinate even when they know it makes things worse because:

A. they lack awareness of the consequences of delay.

B. immediate emotional relief outweighs abstract future costs.

C. they are incapable of learning from past mistakes.

D. rational thinking is completely absent during procrastination.

14. According to the passage, brain imaging studies show that when contemplating tasks they're inclined to delay, people exhibit:

F. increased activity throughout the entire brain.

G. no measurable difference from when considering other tasks.

H. heightened amygdala activity but reduced prefrontal cortex activity.

J. heightened amygdala activity and increased prefrontal cortex activity.

15. Dr. Fuschia Sirois's research suggests that self-compassion reduces procrastination because it:

A. motivates people through positive reinforcement.

B. eliminates all negative emotions about tasks.

C. makes people work harder to prove their worth.

D. reduces the emotional intensity of confronting delayed tasks.

16. The passage describes "temporal discounting" as:

F. a technique for managing time across multiple time zones.

G. the tendency to value immediate rewards more than future rewards.

H. a method for calculating the actual cost of procrastination.

J. the process of forgetting about tasks over time.

17. According to the passage, the key distinction between strategic delay and procrastination is whether:

A. the delay is purposeful or driven by emotional avoidance.

B. the task is eventually completed on time.

C. other people are affected by the delay.

D. the delayed task is important or trivial.

18. The passage suggests that procrastination rates are highest in individualistic cultures because:

F. these cultures have more access to distracting technology.

G. people in these cultures work fewer hours per week.

H. tasks are framed as personal responsibilities, triggering more anxiety.

J. time management education is less available in these cultures.

PASSAGE III — HUMANITIES

This passage is adapted from an essay about the history and cultural significance of jazz music.

Jazz emerged in the early twentieth century from a cultural crossroads—the collision and fusion of African musical traditions, European harmonic structures, and the uniquely American experience of racial segregation and urbanization. Born in New Orleans and matured in cities like Chicago, Kansas City, and New York, jazz became more than a musical genre. It became a language of innovation, resistance, and identity that would influence virtually every form of American popular music that followed.

The African roots of jazz run deep. Enslaved Africans brought to America musical traditions that emphasized rhythm, call-and-response patterns, and improvisation—elements largely absent from European classical music. Work songs, spirituals, and field hollers preserved these African musical sensibilities across generations of slavery. After Emancipation, Black musicians began blending these traditions with European instruments and harmonic structures, creating new hybrid forms. Ragtime emerged in the 1890s, with its syncopated rhythms and piano-based melodies. Blues developed around the same time, with its distinctive chord progressions and emotional expressiveness. These forms provided the direct antecedents to jazz.

New Orleans proved to be the perfect incubator for this new music. The city's unique culture—a French and Spanish colonial history, a significant free Black population even before the Civil War, and a Catholic tolerance for secular pleasures—created space for musical experimentation that didn't exist in other American cities. Congo Square, a public space where enslaved and free Black people could gather on Sundays, became a crucial site where African musical traditions were preserved and performed. After the Civil War, the availability of used brass instruments from disbanded military bands gave Black musicians access to European orchestral instruments. They adapted these instruments to express African-influenced musical ideas, bending notes in ways not found in written music, creating the "blue notes" that would become central to jazz.

The early pioneers of jazz—musicians like Buddy Bolden, Jelly Roll Morton, and Louis Armstrong—were innovators who transformed their instruments into vehicles for personal expression. Armstrong, in particular, revolutionized jazz in the 1920s by shifting emphasis from collective improvisation (where multiple musicians improvised simultaneously) to solo improvisation. His recordings with the Hot Five and Hot Seven demonstrated that jazz could be a virtuosic art form, with individual musicians crafting complex, emotionally powerful statements within the structure of a song. Armstrong's gravelly voice and trumpet playing influenced generations of musicians across all genres.

The swing era of the 1930s and early 1940s brought jazz to its widest popular audience. Big bands led by Duke Ellington, Count Basie, and Benny Goodman filled dance halls with audiences that crossed racial lines, though often only after controversy. When Goodman integrated his band by hiring Black musicians like Teddy Wilson and Lionel Hampton, it was considered radical. Yet the music itself demanded this integration—the collaborative, conversational nature of jazz improvisation didn't recognize racial boundaries, even as American society tried to maintain them.

Duke Ellington deserves particular attention as an artist who elevated jazz to high art while never abandoning its roots in dance and entertainment. Ellington composed thousands of pieces, from three-minute dance numbers to extended suites, always writing for the specific talents of his band members. He understood that jazz wasn't just about following chord changes or technical proficiency—it was about voice, about each musician bringing their unique personality into the music. An Ellington composition written for Johnny Hodges's alto saxophone couldn't be played the same way by anyone else, because it was written for Hodges's specific sound, phrasing, and emotional palette.

After World War II, jazz underwent dramatic transformation. Bebop emerged in the mid-1940s, pioneered by Charlie Parker, Dizzy Gillespie, and Thelonious Monk. This was revolutionary music—complex, fast, harmonically sophisticated, and explicitly not designed for dancing. Bebop musicians were making a statement: jazz was art music, deserving of the same serious attention as classical music. They played in small clubs for attentive listeners rather than large dance halls for social audiences. The music's complexity—rapid chord changes, angular melodies, intricate rhythmic patterns—required dedicated listening. This wasn't background music; it demanded engagement.

Some critics argued that bebop alienated jazz from its popular roots, turning it into an elitist art form. But bebop musicians were responding to their social and artistic moment. They rejected the entertainment role that White-dominated society had assigned to Black musicians. They asserted their intellectual and creative equality through music so sophisticated that it couldn't be dismissed or patronized. When Charlie Parker played, he wasn't just entertaining; he was creating on par with any composer or artist in any genre.

The subsequent decades saw jazz continue to evolve: cool jazz's understated elegance, hard bop's return to blues and gospel roots, modal jazz's exploration of scales rather than chord progressions, free jazz's complete abandonment of traditional structures. Each movement built on what came before while pushing boundaries. Miles Davis, perhaps the most influential figure in post-bebop jazz, continually reinvented himself, moving from bebop to cool jazz to modal to fusion, always several steps ahead of his audience.

But jazz's influence extended far beyond its own genre boundaries. Rock and roll, born in the 1950s, drew directly from blues and rhythm and blues, which were themselves closely related to jazz. Hip-hop, emerging in the 1970s, sampled jazz extensively and shared its emphasis on improvisation, individual voice, and cultural commentary. Contemporary R&B, funk, and electronic music all show jazz influences in their rhythmic complexity and harmonic sophistication.

More broadly, jazz represented a model of **democratic art-making**. A jazz performance is a conversation where musicians listen to each other, respond to each other, build on each other's ideas. The traditional jazz emphasis on "comping"—supporting and responding to a soloist—requires deep listening and collaborative creativity. Everyone gets a turn to speak (to solo), but the ensemble matters more than any

individual. This collaborative, improvisational model influenced everything from corporate brainstorming techniques to educational theories about learning.

Perhaps most importantly, jazz embodied cultural resistance and Black excellence during periods of intense racial oppression. When society told Black Americans they were inferior, jazz musicians created art of stunning sophistication and originality. They did so while facing segregation, discrimination, and violence. The music itself—with its emphasis on individual voice within collective structure, its fusion of traditions, its demand for both discipline and freedom—offered a counter-narrative to the dominant culture's racism.

Today, jazz no longer dominates popular music as it did during the swing era. Its influence is so pervasive that it's often invisible. But understanding jazz history is essential for understanding American history. Jazz tells the story of how oppressed people created beauty from struggle, how artistic innovation happens through cultural fusion, and how music can be both entertainment and high art, both deeply rooted in tradition and radically innovative. It reminds us that America's greatest cultural contributions have often come from its most marginalized communities, and that listening—really listening—to different voices in conversation can create something more beautiful than any single voice alone.

19. The passage indicates that jazz emerged from the combination of:

A. European classical music and American folk traditions exclusively.

B. solely African musical traditions preserved through generations.

C. African musical traditions, European harmonic structures, and American experiences.

D. New Orleans culture and military band instruments alone.

20. According to the passage, African musical traditions brought to America emphasized:

F. written notation and complex harmonic progressions.

G. rhythm, call-and-response patterns, and improvisation.

H. solo performance and individual virtuosity.

J. strict adherence to composed melodies.

21. The passage suggests that New Orleans was an ideal location for jazz to develop because:

A. it had the largest population of any American city.

B. its unique culture created space for musical experimentation.

C. European classical musicians frequently performed there.

D. it was the only city where African Americans lived.

22. According to the passage, Louis Armstrong revolutionized jazz by:

F. shifting emphasis from collective to solo improvisation.

G. introducing European harmonic structures to the music.

H. creating the first jazz big band.

J. inventing the trumpet as a jazz instrument.

23. The passage indicates that Duke Ellington's approach to composition was distinctive because he:

A. refused to write music designed for dancing.

B. composed only extended suites rather than shorter pieces.

C. avoided incorporating his band members' personalities.

D. wrote specifically for individual musicians' unique characteristics.

24. The passage suggests that bebop musicians played complex music in part to:

F. make jazz more accessible to popular audiences.

G. simplify the harmonic structures of earlier jazz.

H. assert their intellectual and creative equality.

J. encourage dancing in small clubs.

25. According to the passage, critics who argued that bebop alienated jazz from its popular roots believed that bebop:

A. had become an elitist art form.

B. was too similar to earlier jazz styles.

C. failed to demonstrate sufficient technical skill.

D. didn't include enough improvisation.

26. The passage describes jazz as "democratic art-making" primarily because:

F. it was performed in public spaces accessible to all.

G. it influenced political movements toward democracy.

H. early jazz musicians formed democratic organizations.

J. it emphasized collaborative listening and responding among musicians.

27. The passage's final paragraph suggests that understanding jazz history is important because it:

A. allows people to appreciate contemporary popular music.

B. provides entertainment value through historical anecdotes.

C. reveals how marginalized communities created significant cultural contributions.

D. teaches musical techniques applicable to other genres.

PASSAGE IV — NATURAL SCIENCE

This passage is adapted from an article about the science of memory formation and retrieval.

For decades, scientists conceptualized memory as relatively straightforward: experiences create memories, which are then stored like files in a cabinet, ready to be retrieved when needed. This storage model, though intuitively appealing, has proven to be fundamentally incorrect. Modern neuroscience reveals that memory is far more dynamic, constructive, and malleable than previously imagined.

Understanding how memory actually works has profound implications for everything from education to criminal justice.

Memory formation begins with encoding—the process by which sensory information is transformed into a form the brain can store. When you experience something—see a sunset, hear a song, taste a meal—specific patterns of neurons fire in your brain. These patterns of neural activity form the basis of a memory trace. But not all experiences become lasting memories. The brain constantly receives far more sensory information than it could possibly store, so it must be selective. Attention plays a crucial role here: experiences you pay attention to are far more likely to be encoded into memory than those that pass unnoticed.

The process of consolidation takes encoded memories and stabilizes them for long-term storage. Immediately after an experience, the memory trace is fragile and susceptible to disruption. Consolidation, which occurs primarily during sleep, strengthens these memory traces by repeatedly reactivating the neural patterns that formed during the initial experience. This is why sleep is so critical for learning—during sleep, particularly during slow-wave sleep and REM sleep, the brain replays experiences, strengthening the connections between neurons that form memory traces.

One of the most surprising discoveries about memory consolidation is that it isn't a single event but an ongoing process. Each time you remember something, you reactivate the neural patterns that constitute that memory. This reactivation makes the memory temporarily unstable again, requiring a process called reconsolidation to restabilize it. This might seem inefficient, but it serves an important function: it allows memories to be updated with new information. When you remember a childhood birthday party, for instance, that memory might be updated with new contexts or associations, becoming richer and more connected to other knowledge.

However, this flexibility comes with a cost: memory is remarkably vulnerable to distortion. Elizabeth Loftus, a psychologist at the University of California, Irvine, has spent decades demonstrating how easily false memories can be created. In one famous series of experiments, she showed participants photographs of a car accident and then asked leading questions about what they'd seen. Participants who were asked "How fast were the cars going when they smashed into each other?" later "remembered" seeing broken glass at the scene, even though no broken glass appeared in the photographs. The leading question altered their memory of the event.

This malleability of memory has serious implications. Eyewitness testimony, long considered highly reliable in court, is actually one of the least reliable forms of evidence. Witnesses can be absolutely confident in memories that are objectively false. The confidence with which a memory is held has little correlation with its accuracy—a finding that challenges our intuitions about memory. We feel that our

memories are accurate recordings of past events, especially vivid memories of important moments. But memory isn't a recording; it's a reconstruction that happens anew each time we remember.

The constructive nature of memory becomes even more apparent when we consider how memories of different elements of an experience are stored separately. When you remember meeting someone at a party, the visual information (what they looked like), auditory information (their voice), emotional information (how you felt), and contextual information (where you were, who else was there) are stored in different brain regions. When you recall that meeting, your brain reconstructs the experience by pulling together information from these separate storage sites. Usually, this reconstruction feels seamless and accurate. But sometimes, the brain connects the wrong elements, creating what psychologists call "source monitoring errors"—remembering real information but attributing it to the wrong source.

Different types of memory also operate through different neural mechanisms. Semantic memory—memory for facts and general knowledge—relies heavily on the temporal lobes and doesn't require remembering where or when you learned the information. You know that Paris is the capital of France, but you probably can't remember when or where you learned this fact. Episodic memory—memory for specific personal experiences—depends critically on the hippocampus and involves remembering contextual details. Procedural memory—memory for skills and how to do things—relies on different brain structures entirely, including the basal ganglia and cerebellum, which is why you can remember how to ride a bicycle even if you can't remember when you learned.

The hippocampus deserves special attention because of its central role in forming new episodic memories. Damage to the hippocampus, from injury or disease, typically prevents the formation of new long-term memories while leaving older memories relatively intact. The famous case of patient H.M., who had portions of his hippocampus removed to treat epilepsy, revealed this function. After surgery, H.M. could still remember his childhood and events from years before the operation, but he couldn't form new episodic memories. He would forget conversations minutes after they ended, couldn't remember people he met after surgery, and had no memory of the surgery itself. Yet his intelligence, personality, and ability to learn new motor skills remained intact, demonstrating the specificity of hippocampal function.

Age affects memory, but not uniformly. Older adults often experience difficulty with episodic memory—remembering specific events and when they occurred—while semantic memory (general knowledge) remains stable or even continues to grow. Working memory, the ability to hold and manipulate information for brief periods, also tends to decline with age. However, procedural memory remains relatively preserved. An older adult might forget where they parked their car (episodic memory) but won't forget how to drive it (procedural memory).

Interestingly, memory isn't only about the past; it's also crucial for imagining the future. Brain imaging studies show that remembering past experiences and imagining future scenarios activate remarkably similar brain networks. This makes sense when you consider that imagining the future requires recombining elements from past experiences in new ways. If you're planning a beach vacation, your brain draws on memories of previous beach trips, other vacations, beaches you've seen in media, and more, combining these elements to simulate possible future experiences. Patients with amnesia who can't form new memories also struggle to imagine specific future events, suggesting that memory and future imagination are closely linked capacities.

The study of memory also reveals important insights for learning and education. The "testing effect" demonstrates that actively retrieving information from memory strengthens that memory more effectively than simply reviewing the material. This is why practice tests are more valuable for learning than rereading notes. Each time you retrieve information, you strengthen the neural pathways involved, making future retrieval easier. Spacing out study sessions over time (distributed practice) is more effective than cramming because it requires repeated retrieval and reconsolidation, building stronger, more durable memories.

Understanding memory's constructive nature should make us appropriately humble about our own memories. That vivid childhood memory that feels completely accurate might be a reconstruction influenced by photographs you've seen, stories you've been told, and memories that have been unconsciously embellished over time. This doesn't mean all memories are false or that memory is unreliable for practical purposes. Most memories are accurate enough to serve us well in daily life. But recognizing memory's limitations and malleability should make us cautious about over-relying on memory, especially in high-stakes contexts like criminal justice.

The science of memory reveals that our minds are not recording devices but meaning-making systems. We don't passively store experiences; we actively construct memories in ways that serve our current needs and understanding. Memory is not about perfect fidelity to the past but about creating useful representations that help us navigate the present and anticipate the future. This dynamic, flexible system has served humans remarkably well, even as it occasionally leads us astray with false memories and forgotten details. Understanding how memory truly works allows us to work with our cognitive systems more effectively, using evidence-based strategies for learning while maintaining appropriate skepticism about the absolute accuracy of what we remember.

28. According to the passage, the traditional "storage model" of memory conceptualized memory as:

F. files stored in a cabinet and retrieved when needed.

G. a constantly changing and reconstructive process.

H. different types operating through separate mechanisms.

J. patterns of neural activity that require consolidation.

29. The passage indicates that attention plays a crucial role in memory formation because:

A. it determines how long memories will be retained.

B. experiences you pay attention to are more likely to be encoded.

C. without attention, consolidation cannot occur during sleep.

D. it prevents false memories from being created.

30. According to the passage, memory consolidation occurs primarily during:

F. the initial encoding of sensory information.

G. the process of reactivating memory traces.

H. sleep, particularly slow-wave and REM sleep.

J. periods of intense focus and concentration.

31. The passage explains that reconsolidation allows memories to be:

A. permanently fixed and protected from change.

B. erased when they are no longer needed.

C. stored in a single location in the brain.

D. updated with new information and contexts.

32. Elizabeth Loftus's research on car accidents demonstrated that:

F. eyewitness memories are completely unreliable in all situations.

G. leading questions can alter people's memories of events.

H. photographs prevent false memories from being created.

J. confident memories are always accurate memories.

33. The passage indicates that when recalling an experience, the brain reconstructs the memory by:

A. pulling together information from separate storage sites in different brain regions.

B. activating only the hippocampus, which stores complete memories.

C. retrieving a single unified file from long-term storage.

D. creating entirely new experiences unrelated to the original event.

34. According to the passage, procedural memory differs from episodic memory in that procedural memory:

F. is more vulnerable to distortion and false information.

G. requires remembering when and where skills were learned.

H. depends heavily on the hippocampus for storage.

J. relies on different brain structures like the basal ganglia.

35. The case of patient H.M. demonstrated that hippocampal damage:

A. destroys all previously formed memories.

B. prevents intelligence and personality from developing.

C. prevents formation of new episodic memories while preserving older ones.

D. eliminates the ability to learn any new information.

36. The passage suggests that memory and imagination of future events are linked because:

F. imagining the future requires recombining elements from past experiences.

G. both processes occur exclusively in the hippocampus.

H. amnesia patients have enhanced ability to imagine the future.

J. future events always match our memory-based predictions.

Science (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

Some students performed three studies to measure the average speed on a flat surface of a remote-controlled car with different types of wheels. Each study was conducted indoors in a temperature-controlled room. A straight track was constructed and measured to be 75 feet long. The car's travel time was measured from start to finish with a stopwatch. The temperature in the room was kept constant at 20°F and the surface was returned to its original condition after each trial. No modifications were made to the car aside from changing the wheels, and the car's batteries were fully charged before each trial.

Study 1

The students fitted the car with hard rubber wheels, which had deep treads, and placed it on the surface. One student started the car as another student simultaneously started the stopwatch. The student stopped the stopwatch as the car crossed the 75-foot mark. The students calculated the results of three separate trials and averaged the results (see Table 1).

Table 1

Trial	Time (s)	Speed (ft/s)
1	22.8	3.28
2	23.2	3.23
3	22.5	3.33
Average:	22.8	3.28

Study 2

The students repeated the procedure used in Study 1, except they fitted the car with soft rubber wheels, which were smooth and lacked treads. The results are shown in Table 2.

Table 2

Trial	Time (s)	Speed (ft/s)
1	57	1.31
2	56.4	1.33
3	56.7	1.32
Average:	56.7	1.32

Study 3

The students repeated the procedure used in Study 1, except they fitted the car with hard rubber wheels, which had studs imbedded into them instead of treads. The results are shown in Table 3.

Table 3

Trial	Time (s)	Speed (ft/s)
1	11.3	6.64
2	11.6	6.47
3	12.1	6.20
Average:	11.7	6.44

1. The fastest times resulted from using which wheels?

A. The speeds remained constant.

B. Hard rubber wheels with studs imbedded in them.

C. Soft rubber wheels with no treads.

D. Hard rubber wheels with deep treads.

2. According to Study 1, the average speed for all three trials was:

F. greater than the speed measured in Trial 3.

G. less than the speed measured in Trial 1.

H. greater than the speed measured in Trial 2.

J. equal to the speed measured in Trial 2.

3. Which of the following statements is best supported by the results of all three studies?

A. The average speed of a car with deeply treaded hard rubber wheels is approximately ½ the average speed of car with soft rubber wheels.

B. The average speed of a car with studded, hard rubber wheels is approximately ½ the average speed of car with deeply treaded hard rubber wheels.

C. The average speed of a car with soft rubber wheels lacking treads is approximately twice the average speed of car with deeply treaded hard rubber wheels.

D. The average speed of a car with studded, hard rubber wheels is approximately twice the average speed of car with deeply treaded hard rubber wheels.

4. Based on the passage, the higher average speeds were probably the result of:

F. greater friction.

G. temperature variations.

H. too much sunlight.

J. statistical error.

5. During which of the following was the travel time of the car the slowest?

A. Study 2, Trial 1

B. Study 2, Trial 2

C. Study 3, Trial 1

D. Study 1, Trial 2

PASSAGE II

The ninth planet of our solar system, Pluto, was discovered in 1930. It is the smallest planet in the solar system, with a surface area more than 300 times smaller than Earth's. Recently, Pluto's categorization as a planet has been debated. Two scientists discuss whether Pluto is a planet or another celestial object.

Scientist 1

Pluto is most certainly a planet. Some astronomers have suggested that Pluto be stripped of its planetary status, arguing that it is more accurately categorized as an asteroid or comet. However, with a 1,413 mile diameter, Pluto is almost 1,000 times bigger than an average comet, and it does not have a tail of dust and gas as comets do. A planet can be described as a non-moon, sun-orbiting object that does not generate nuclear fusion and is large enough to be pulled into a spherical shape by its own gravity. Strictly by definition alone, Pluto is a planet. Pluto is clearly not a moon, as it does not orbit another planet. Although Pluto's orbital path is irregular as compared with the other planets of the solar system, it undisputedly orbits the sun. Pluto does not generate heat by nuclear fission, distinguishing it from a star. It is large enough to be pulled into a spherical shape by its own gravitational force, distinguishing it from either a comet or an asteroid.

Scientist 2

There are many facts about Pluto suggesting that it is actually not a planet but a member of the Kuiper Belt, a group of sizable comets that orbit the sun beyond Neptune. First, Pluto is composed of icy material, as are the comets in the Kuiper Belt, while the other planets of the solar system fall into one of two categories: rocky or gaseous. The four inner planets, Mercury, Venus, Earth, and Mars are rocky planets; Jupiter, Saturn, Uranus, and Neptune are gaseous. Pluto is neither rocky nor gaseous but has an icy composition. In addition, Pluto is much too small to be a planet. It is less than half the diameter of the next smallest planet, Mercury. The Earth's moon is even larger than Pluto. Finally, the eccentricity of Pluto's orbit indicates that it is not a planet. Pluto is generally considered the ninth planet, but for twenty years of its 249 year orbit, it is actually closer to the sun than is Neptune, making it the eighth planet during that period of time. This irregular orbit is shared by over seventy Kuiper Belt comets.

6. Which of the following phrases best describes the major point of difference between the two scientists' viewpoints?

F. The actual location of Pluto in the solar system.

G. The length of Pluto's orbit.

H. The shape of Pluto.

J. The classification of Pluto as a planet.

7. According to Scientist 2's viewpoint, compared to other planets of the solar system, Pluto's surface is:

A. less icy.

B. more icy.

C. more gaseous.

D. more rocky.

8. Scientist 1's viewpoint indicates that Pluto differs from asteroids and comets in all of the following ways EXCEPT:

F. Pluto can generate heat through nuclear fission.

G. Pluto is pulled into a spherical shape by its own gravitational force.

H. Asteroids and comets have a tail of gas and dust particles.

J. Asteroids and comets are much smaller than Pluto.

9. The polar ice caps on Pluto's surface melt one time during every 249-year orbit, exposing Pluto's truly rocky surface, which is similar to that of Mars. Based on the information provided, this finding, if true, would most likely weaken the position(s) of:

A. Scientist 1 only.

B. Scientist 2 only.

C. both Scientist 1 and Scientist 2.

D. neither Scientist 1 nor Scientist 2.

10. With which of the following statements would both scientists most likely agree?

F. The size of Pluto indicates that it could actually be a satellite of another planet.

G. Pluto should be classified as neither a planet nor a comet; a new category is indicated.

H. The surface composition of Pluto is irrelevant and should not be considered in its classification.

J. Pluto's erratic orbit differentiates it from all other planets in the solar system.

11. Scientist 1's viewpoint would be weakened by which of the following observations, if true?

A. Scientists have recently discovered a Kuiper Belt comet with a radius of almost 1,500 miles.

B. Pluto only has one moon, Charon, which is half the size of Pluto.

C. Planets can be distinguished from comets by the lack of gas and dust particles in the wake of their orbits.

D. Comets and asteroids are capable of generating nuclear fission.

12. Which of the following statements best describes how Scientist 2 likens Pluto to a Kuiper Belt comet?

F. Neither Pluto nor Kuiper Belt comets have identifiable atmospheres.

G. Neither Pluto nor Kuiper Belt comets are trailed by a cloud of gases and dust.

H. Both Pluto and Kuiper Belt comets have similar eccentric orbital patterns.

J. Both Pluto and Kuiper Belt comets are roughly half the size of the next smallest planet, Mercury.

PASSAGE III

A solute is any substance that is dissolved in another substance, which is called the solvent.

A student tested the solubility (a measure of how much solute will dissolve into the solvent) of six different substances. The solubility of a substance at a given temperature is defined as the concentration of the dissolved solute that is in equilibrium with the solvent.

Table 1 represents the concentration of dissolved substances in 100 grams of water at various temperatures. The concentrations are expressed in grams of solute per 100 grams of water.

Table 1

	Concentration of solute (g/100 g H_2O)					
Temp (°C)	KCl	$NaNO_3$	HCl	NH_4Cl	NaCl	NH_3
0	28	72	83	29	37	90
20	33	86	72	37	37	55
40	39	105	63	46	38	36
60	45	125	55	55	38	23
80	51	145	48	66	39	14
100	57	165	43	77	40	8

13. According to Table 1, the concentrations of which of the following substances varies the least with temperature?

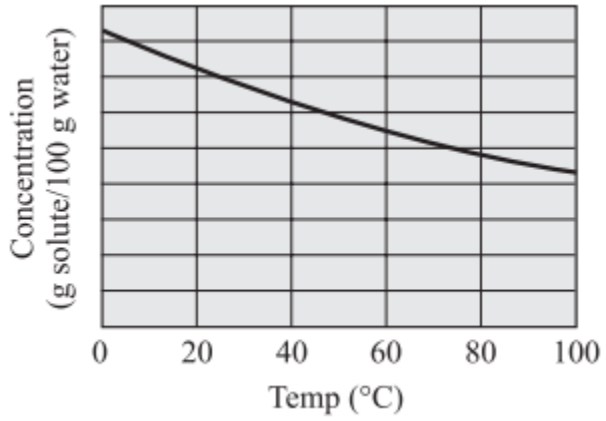
A. HCl

B. NH_3

C. NaCl

D. KCl

14. The graph below best represents the relationship between concentration and temperature for which of the following substances?



F. HCl

G. $NaNO_3$

H. NaCl

J. KCl

15. The data shown in Table 1 support the conclusion that, for a given substance, as the temperature of the water increases, the amount of solute that can be dissolved:

A. increases only.

B. decreases only.

C. varies, but there is a trend depending on the substance.

D. varies, but with no particular trend.

16. According to Table 1, HCl would most likely have which of the following concentrations at 70°C?

F. 25.5 g/100g H_2O

G. 37.0 g/100g H_2O

H. 48.5 g/100g H_2O

J. 51.5 g/100g H_2O

17. A scientist wants to dissolve at least 50 grams of NH_4Cl in 100 g of water in order for the solution to be the proper concentration for use in an experiment. A reasonable minimum temperature for the solution would be:

A. 25°C

B. 30°C

C. 35°C

D. 50°C

PASSAGE IV

Salt pans are unusual geologic formations found in deserts. They are formed in endorheic basins, which are lowland areas where water collects but has no outflow. Any rain that falls or any water that is collected in an endorheic basin remains there permanently, except for what is lost through evaporation. This type of closed system often leads to a high concentration of salt and other minerals.

Study 1

Four different salt pans around the world were studied. The volumes of mineral deposits were estimated from the surface areas of the salt pans and the average thickness of the deposits. The ages of the salt pans were also estimated based on the mineral volume. The estimates are shown in Table 1.

Table 1		
Salt pan	Estimated mineral volume (km^3)	Estimated age (million years)
A	2,000,000	4.5
B	4,500,000	5.7
C	5,700,000	10.8
D	12,150,000	21.0

Study 2

The same four salt pans were excavated for fossils. Fossil remnants of extinct plant species were found within each of the salt pans. The ages of the fossils found were similar to the ages of the salt pans (See Table 2). Scientists hypothesize that flooding of each salt pan may have led to the extinction of the plant species.

Table 2		
Salt pan	Type of fossils found	Estimated age of fossils (million years)
A	Plant species *q*	4.4
B	Plant species *r*	5.5
C	Plant species *s*	10.2
D	Plant species *t*	19.9

18. Which of the following statements is best supported by information in the passage?

F. Water that has collected in endorheic basins is at least 21.0 million years old.

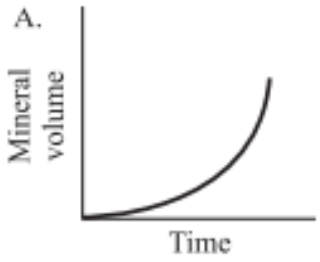
G. The age of fossilized plant species cannot be precisely estimated.

H. More water has collected in and evaporated from older salt pans.

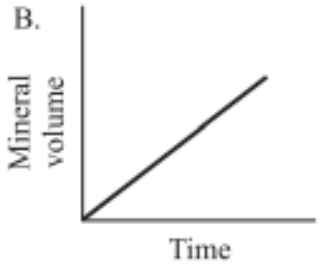
J. Any endorheic basin that is less than 2.0 million years old contains no fossils.

19. Which one of the following graphs best represents the relationship between the mineral volume and the age of the salt pans, according to Study 1?

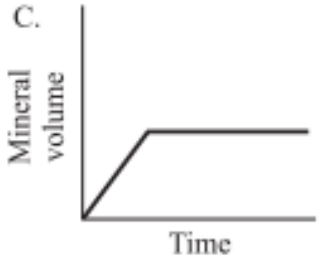
A.



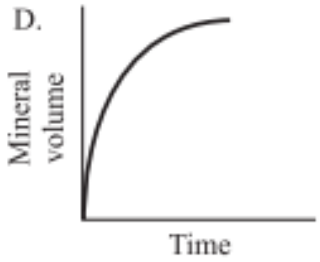
B.



C.



D.



20. Is the conclusion that Salt pan A contains more extinct plant fossils than does Salt pan D supported by information in the passage?

F. Yes, because Salt pan A is younger than Salt pan D.

G. Yes, because the passage suggests that it is easier for plants to grow in areas with a lower mineral volume.

H. No, because Salt pan D contains a different type of fossilized plant.

J. No, because the passage does not include data regarding the quantity of plant fossils found in the salt pans.

21. From the results of Table 1, you could conclude that a salt pan formed more than 21 million years ago would have a mineral value:

A. between 5,700,000 km^3 and 12,150,000 km^3.

B. equal to approximately ½ the mineral volume of Salt pan B.

C. greater than 12,150,000 km^3.

D. less than 2,000,000 km^3.

22. A fossilized plant approximately 9.7 million years old was recently discovered in a salt pan in North America. It was most likely found in a salt pan similar to:

F. Salt pan A.

G. Salt pan B.

H. Salt pan C.

J. Salt pan D.

PASSAGE V

Petroleum, or crude oil, is refined by separating it into different by-products. This process is called fractional distillation, whereby the crude oil is heated and each different product is distilled, or drawn off, at different stages. Each product is distilled at certain temperature ranges and collected in separate receivers. Petroleum refining is carried out in a boiler and a fractionating tower. The crude oil is super-heated in the boiler to about 600°C, which vaporizes the crude oil. The vapors then rise in the tower to certain levels where they cool and condense, according to their chemical structure. When the vapor reaches a height in the tower where the temperature in the column is equal to the boiling point of the substance, the vapor turns into liquid (condenses), collects in troughs, and flows into various tanks for storage, as shown in Figure 1. Table 1 below summarizes the characteristics of the by-products obtained from the fractional distillation of petroleum.

Table 1	
Petroleum by-product	Condensation temperature (°C)
Petroleum gas	20–40
Gasoline	40–70
Kerosene	100–120
Gas oil	120–200
Lubricating oil stocks	200–300
Residue	600

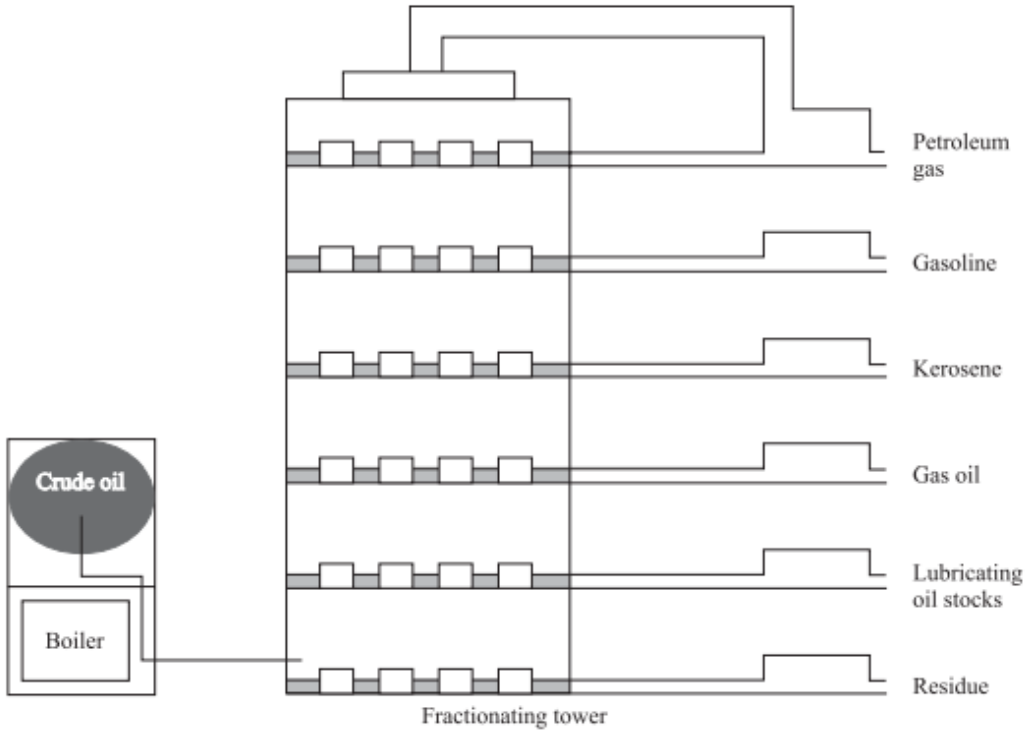


Figure 1

23. According to the passage, the temperature at which gasoline condenses is most likely:

A. less than 0°C.

B. less than 40°C.

C. greater than 20°C.

D. greater than 70°C.

24. According to the passage, which by-product formed in the fractionating tower condenses first?

F. Petroleum gas

G. Kerosene

H. Gas oil

J. Residue

25. According to Figure 1, fractional distillation uses which of the following as a raw material?

A. Gasoline

B. Residue

C. Crude oil

D. Gas oil

26. Given that naptha, another by-product of petroleum distillation, has a condensation point of approximately 90°C, between which two petroleum by-products would this substance be found in a fractionating tower?

F. Gasoline and kerosene

G. Lubricating oil stocks and gas oil

H. Kerosene and gas oil

J. Residue and lubricating oil stocks

27. According to the passage, at what temperature is most of the crude oil vaporized?

A. 600°C

B. 300°C

C. 100°C

D. 20°C

28. According to the passage, as the vapor rises in the fractionating tower:

F. the condensation temperature increases only.

G. the condensation temperature decreases only.

H. the condensation temperature increases quickly, then slowly decreases.

J. the condensation temperature remains stable at 600°C.

PASSAGE VI

Scientists theorize that the release of X-rays by distant stars and the amount of distortion or "bending" the X-rays endure as they travel out of their solar system can help indicate the presence of planets orbiting these stars. The distortion of the X-rays would be caused by the gravitational pull exerted by the planets. Specifically, high 'bending' in these rays would indicate the presence of large planets, while a low level of bending would most likely signify the presence of smaller planets.

In addition to determining whether or not there are planets circling a distant star, the amount of X-ray distortion can determine the planets' orbital pattern. A circular orbit produces increasing or decreasing distortions of the same level. For instance, if a star's X-rays are bent 1 meter the first day, 2 meters the fourth day, 4 meters the seventh day, and so on, it indicates a circular orbit. See Figure 1. If however, the pattern of bending is random, as in a bending of 5 meters the first day, 3 meters the second day, 0 meters the third day, and 7 meters the fourth day, then the planet's orbit is elliptical. See Figure 2. Further, if the paths of the X-rays are not bent in any way, it is assumed that the star lacks any planets.

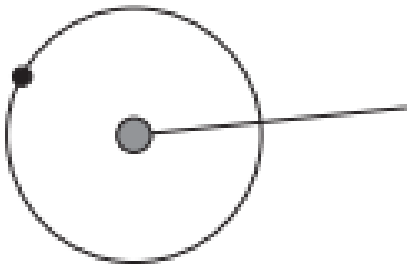


Figure 1 Circular orbit

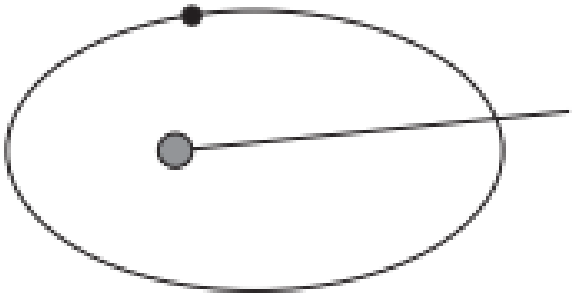


Figure 2 Elliptical orbit

Table 1 shows the amount of distortion of X-rays released by 4 different stars over a period of 10 days.

Table 1

	X-ray distortion (m)			
	Day 1	Day 4	Day 7	Day 10
Star 1	1.00	1.75	2.50	3.25
Star 2	0.00	0.00	0.00	0.00
Star 3	8.00	4.00	2.00	1.00
Star 4	0.20	0.10	0.11	0.11

Note: Assume that there are no other objects that could affect the X-rays.

29. According to Table 1, which star most likely has no planets?

A. Star 1

B. Star 2

C. Star 3

D. Star 4

30. Based on the information in the passage, how many of the stars listed in Table 1 have at least one planet with a circular orbit?

F. 0

G. 2

H. 3

J. 4

31. Which of the following statements is best supported by information in the passage?

A. Star 3 is likely orbited by at least one large planet.

B. Star 4 has a circular orbit.

C. Star 1 has an elliptical orbit.

D. Star 2 is likely orbited by several small planets.

32. If X-ray distortion were observed for an additional three days, one could predict that the path of the X-rays produced by Star 1 on day 13 would be distorted by:

F. 0.75 meters.

G. 1.00 meter.

H. 3.75 meters.

J. 4.00 meters.

33. According to information in the passage, which of the following assumptions could be true?

A. X-rays are affected by certain physical forces.

B. X-rays are simply bits of energy and are, therefore, unaffected by physical forces.

C. Planets with elliptical orbits are more common than are planets with circular orbits.

D. The presence of planets orbiting a star can only be detected using X-ray distortion.

34. Based on information in the passage, which of the following stars most likely has at least one planet with an elliptical orbit?

F. Star 2 only

G. Star 4 only

H. Stars 1 and 3 only

J. Stars 1, 3, and 4 only

PASSAGE VII

Bacteria can be categorized by how they respond, as indicated by reproduction and growth, to certain temperatures. They are grouped into four categories—psychrophiles, psychrotrophs, mesophiles, and thermophiles—based on their growth response to certain temperatures. Minimal growth temperature is the lowest point at which the bacteria will reproduce. Optimum growth point is the temperature at which the bacteria reproduce most efficiently. Maximum growth point is the very highest temperature to which the bacteria will respond, beyond which the bacteria will not reproduce at all. Table 1 lists the types of bacteria as well as the growth points for each.

Table 1

Growth points or ranges (°C)			
Classifications	Minimum	Optimum	Maximum
Psychrophile	below 0	10–15	below 20
Psychrotroph	0–5	15	30
Mesophile	5–25	18–45	30–50
Thermophile	25–45	50–60	60–90

Table 2			
Cardinal growth points (°C)			
Bacteria name	Minimum	Optimum	Maximum
Anoxybacillus flavithermus	30	60	72
Bacillus flavothermus	30	60	72
Clostridium perfringens	15	45	50
Escherichia coli	10	37	45
Listeria monocytogenes	1	34	45
Micrococcus cryophilus	0	15	30
Staphylococcus aureus	10	37	45
Streptococcus pyogenes	20	37	40
Streptococcus pneumoniae	25	37	42

Table 2 represents a list of common bacteria and their growth points.

35. The category of bacteria appearing the most frequently in Table 2 is:

A. psychrophile.

B. psychrotroph.

C. mesophile.

D. thermophile.

36. The type of bacteria found in Table 2 that does not fit exactly into any of the categories listed in Table 1 is:

F. Clostridium perfringens.

G. Listeria monocytogenes.

H. Micrococcus cryophilus.

J. Streptococcus pneumoniae.

37. Average human body temperature is 40°C. According to Table 2, which of the following bacteria would grow most successfully in the human body?

A. Anoxybacillus flavithermus.

B. Clostridium perfringens.

C. Escherichia coli.

D. Listeria monocytogenes.

38. A new bacteria was discovered by scientists. It reproduces best at 55°C and does not show any new growth if exposed to temperatures above 65°C. This bacteria can most likely be categorized as a:

F. psychrophile.

G. psychrotroph.

H. mesotroph.

J. thermophile.

39. Based on the information in Table 2, which bacteria has the smallest growth range?

A. Listeria monocytogenes.

B. Micrococcus cryophilus.

C. Streptococcus pneumoniae.

D. Streptococcus pyogenes.

40. According to information provided in the passage, Listeria monocytogenes stop reproducing at what temperature?

F. >1°C, but <10°C

G. >10°C, but <34°C

H. >34°C, but <45°C

J. >45°C

Writing

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.

ESSAY TASK

The Four-Day School Week

A growing number of school districts across the country are experimenting with four-day school weeks, compressing instruction into Monday through Thursday while extending daily hours, with Fridays off for students and teachers. Proponents cite benefits including improved teacher retention, reduced burnout, lower operational costs, and better student mental health. Critics worry about lost instructional time, challenges for working parents who need childcare on Fridays, and potential negative impacts on student achievement, particularly for disadvantaged students who may lack structured activities or supervision on the additional day off. As more districts consider this schedule change, communities must weigh the potential benefits against possible drawbacks and consider who truly benefits from this restructuring of the traditional school week.

Read and carefully consider these perspectives. Each suggests a particular way of thinking about the four-day school week.

Perspective One

The four-day school week is a necessary evolution that benefits everyone in the educational system. Teachers facing burnout and exodus from the profession would gain an extra day for planning, professional development, and personal rejuvenation, making the career more sustainable. Students would have reduced stress and more time for extracurricular activities, family bonding, part-time jobs, or independent projects that foster real-world skills. The three-day weekend allows for deeper rest and recovery, leading to more focused, productive learning during the four days students are in school. Additionally, schools save money on transportation, utilities, and meals—resources that can be redirected to instructional programs. The traditional five-day week is an outdated industrial model; it's time to modernize our approach to match what we now understand about productivity, mental health, and effective learning.

Perspective Two

While a four-day week may appeal to some, it creates significant inequities and overlooks the essential role schools play beyond academics. For many students, especially those from low-income families, school provides not just education but also meals, safety, and structure. An extra day at home may mean hunger, lack of supervision, or even danger for vulnerable children. Working parents, particularly single parents or those in hourly jobs, face impossible choices about childcare for that fifth day—a burden that disproportionately affects families who can least afford it. Furthermore, younger children struggle with longer school days; sitting in class from 7:30 AM to 4:30 PM exceeds their developmental capacity for sustained attention. Rather than improving education, the four-day week shifts costs and responsibilities from schools to families, widening the opportunity gap between privileged and disadvantaged students.

Perspective Three

The four-day school week may work in specific contexts but cannot be a one-size-fits-all solution. Rural districts with small enrollments, long bus routes, and teacher recruitment challenges might genuinely benefit from this model. However, urban and suburban districts with different demographics, resources, and needs require different solutions. The effectiveness of a four-day week depends entirely on implementation details: Are school days extended to truly maintain instructional hours, or is learning time actually reduced? What community resources exist for students on the off day? How does the change affect extracurricular activities, sports schedules, and student employment? Rather than debating whether four-day weeks are universally good or bad, we should be asking: Under what specific circumstances does this model serve students well, and how can communities thoughtfully assess whether it's right for their particular context?

ESSAY TASK

Write a unified, coherent essay about the four-day school week. In your essay, be sure to:

- Analyze and evaluate the perspectives given
- State and develop your own perspective on the issue
- Explain the relationship between your perspective and those given

Your perspective may be in full agreement with any of the given perspectives, in partial agreement, or wholly different. Whatever the case, support your ideas with logical reasoning and detailed, persuasive examples.

ANSWERS AND EXPLANATIONS

English

1. B. The passage is written in simple past tense describing completed events. "Fell" is the correct simple past form. Choice (A) "had fallen" uses unnecessary past perfect. Choice (C) "has fallen" incorrectly uses present perfect. Choice (D) "falls" is present tense.

2. J. Two independent clauses require proper separation. A semicolon correctly joins closely related independent clauses. Choice (F) creates a comma splice. Choice (G) creates awkward structure. Choice (H) works but the semicolon better shows the relationship.

3. C. Three parallel items need a conjunction before the final element. "And" correctly completes the series. Choice (A) "and also" is redundant. Choice (B) is excessively wordy. Choice (D) adds unnecessary temporal meaning.

4. G. "However" at the beginning of a sentence requires a comma after it. Choice (F) lacks punctuation. Choices (H) and (J) use incorrect punctuation marks.

5. A. This choice establishes the crucial contrast between Mrs. Chen's vision and others' pessimism, which drives the narrative. Choices (B), (C), and (D) provide less relevant details.

6. J. Two independent clauses should be separated by a period. Choices (F) and (H) create comma splices. Choice (G) could work but a period is clearer here.

7. C. A comma precedes a coordinating conjunction when it joins two independent clauses. Choice (A) lacks the necessary comma. Choice (B) incorrectly uses a semicolon before "but." Choice (D) is the same as (A).

8. G. Two independent clauses joined by "but" need a comma before the conjunction. Choice (F) lacks the comma. Choice (H) is correct. Choice (J) uses incorrect punctuation.

9. A. Parallel structure requires matching verb forms. "Divided" maintains parallelism with "formed" (both simple past). Choices (B), (C), and (D) break parallel structure.

10. J. No punctuation should separate a subject from its verb. Choices (F), (G), and (H) incorrectly add punctuation.

11. C. This provides a specific time marker and directly states the garden's thriving condition, effectively introducing the paragraph's content. Choices (A), (B), and (D) are less effective transitions.

12. H. The sentence requires parallel simple past tense verbs: "climbed," "wound," and "released." Choice (F) uses present tense. Choices (G) and (J) break parallelism.

13. A. This emphasizes the social impact beyond gardening, capturing the passage's theme about community connection. Choices (B), (C), and (D) remain too narrow in focus.

14. H. No internal punctuation belongs in the prepositional phrase "instead of commercial yeast." Choices (F) and (G) incorrectly add commas. Choice (J) ends with a comma instead of a period.

15. B. The singular subject "technique" requires the singular verb "creates." Choice (A) is a participle, not a finite verb. Choices (C) and (D) use plural forms.

16. J. Two independent clauses require separation with a period. Choices (F) and (H) create comma splices. Choice (G) could work but a period provides clearer separation.

17. C. The compound subject "Wild yeast and bacteria" is plural and requires the plural verb "colonize." Choices (A) and (B) use singular forms. Choice (D) is a participle.

18. G. No punctuation separates a subject from its verb. "The carbon dioxide" is the subject; "creates" is the verb. Choices (F), (H), and (J) incorrectly add punctuation.

19. B. The sentence requires the singular verb "requires" to match the gerund subject "Maintaining a sourdough starter." No punctuation should separate subject from verb.

20. F. The plural "bakers" requires the plural possessive pronoun "their." Choices (G), (H), and (J) use singular or incorrect forms.

21. A. Same as question 20—"their" correctly matches plural "bakers." Choices (B), (C), and (D) use incorrect forms.

22. G. Two independent clauses require separation with a period. Choice (F) creates a comma splice. Choice (H) could work but a period is clearer. Choice (J) is a run-on.

23. B. A comma sets off the participial phrase "passing them down through generations." Choice (A) lacks necessary punctuation. Choices (C) and (D) create fragments.

24. H. Two independent clauses require separation. A period correctly divides these sentences. Choice (F) creates a comma splice. Choice (G) is a run-on. Choice (J) could work but a period is clearer.

25. C. The essay mentions chemical processes briefly but focuses primarily on maintaining starters. Choices (A) and (B) overstate the chemical coverage. Choice (D) is factually incorrect.

26. F. A comma separates an introductory dependent clause from the main clause. Choices (G), (H), and (J) use incorrect punctuation.

27. C. The singular subject "phenomenon" requires the singular verb "occurs." Choice (A) is plural. Choice (B) is a participle. Choice (D) uses plural form.

28. H. Two independent clauses require separation with a period. Choice (F) is a run-on. Choice (G) creates a comma splice. Choice (J) could work but a period is clearer.

29. D. Two independent clauses require separation. A period creates clear division between ideas. Choice (A) creates a comma splice. Choice (B) is a run-on. Choice (C) could work but a period is clearer.

30. G. A colon introduces a list after an independent clause. Choice (F) uses a semicolon incorrectly. Choice (H) uses a dash. Choice (J) uses a comma.

31. B. The introductory phrase "for example" requires a comma after it. Choice (A) lacks punctuation. Choices (C) and (D) use incorrect punctuation.

32. F. The sentence structure maintains clarity with the existing punctuation and organization.

33. D. This choice creates proper sentence structure without comma splices or run-ons.

34. G. Two independent clauses (one defining luciferin/luciferase, one describing their interaction) require separation. A period correctly divides them. Choice (F) creates a run-on. Choices (H) and (J) use incorrect punctuation.

35. B. "Interact" accurately describes the chemical relationship between luciferin and luciferase. Other choices change meaning or clarity.

36. F. A non-restrictive "which" clause adds extra information and requires a comma. Choice (G) uses incorrect punctuation. Choice (H) would make it restrictive. Choice (J) uses a colon incorrectly.

37. C. This directly connects research to practical applications, effectively transitioning to the paragraph's content. Choices (A), (B), and (D) are less direct or specific.

38. G. The infinitive phrase "to track diseases" expresses purpose and needs no punctuation before it. Choices (F), (H), and (J) incorrectly add punctuation.

39. B. A colon introduces the specification of what's appearing. Choice (A) is a run-on. Choice (C) uses a semicolon incorrectly. Choice (D) creates unclear structure.

40. G. Two independent clauses require separation. A period correctly divides them. Choice (F) is a run-on. Choice (H) creates a comma splice. Choice (J) could work but a period is clearer.

41. C. A colon introduces the explanation of the principle. Choice (A) creates a comma splice. Choice (B) doesn't signal the explanatory relationship clearly. Choice (D) is a run-on.

42. F. The plural noun subject "The refrigerators" maintains clarity and correct number. Choices (G), (H), and (J) create number disagreement or less clarity.

43. D. A comma separates the introductory dependent clause from the main clause. Choices (A), (B), and (C) use incorrect punctuation.

44. G. The first sentence ends with a period, and "Furthermore," begins the new sentence with proper punctuation. Choice (F) is a run-on. Choices (H) and (J) use incorrect punctuation.

45. B. This directly and effectively signals the shift to discussing challenges. Choices (A), (C), and (D) are weaker or less direct.

46. F. The gerund phrase "Maintaining food safety" is singular and requires the singular verb "requires." Choice (G) is plural. Choices (H) and (J) use non-finite forms.

47. D. Two independent clauses require separation. A period correctly creates two distinct sentences. Choice (A) is a run-on. Choice (B) creates a comma splice. Choice (C) could work but a period is clearer.

48. G. Present tense "question" maintains consistency with the passage's present tense discussion of current conditions. Choice (F) uses past tense inconsistently. Choices (H) and (J) don't fit as well.

49. B. Two independent clauses require separation. A period correctly divides them. Choice (A) is a run-on. Choice (C) creates a comma splice. Choice (D) could work but a period is clearer.

50. F. The underlined portion provides specific evidence of how community monitoring maintains safety, directly supporting the self-regulation claim. Choice (G) incorrectly calls it unnecessary. Choice (H) incorrectly calls it repetitive. Choice (J) mischaracterizes it as contradictory.

Mathematics

1. C. The question asks you to evaluate the expression $3x + 7$ when $x = 5$. To solve, substitute 5 for x in the expression: $3x + 7 = 3(5) + 7$. Following order of operations, multiply first: $3 \times 5 = 15$. Then add 7 to get the final result: $15 + 7 = 22$. The answer is 22.

2. B. The question asks for the sale price after a 20% discount on a $45 shirt. First, calculate the discount amount by finding 20% of $45. Convert 20% to a decimal: $20\% = 0.20$. Multiply: $0.20 \times 45 = 9$ dollars. This means the discount is $9. Now subtract the discount from the original price to find the sale price: $45 - 9 = 36$ dollars. The sale price is $36.

3. D. The question asks you to solve the linear equation $4x - 8 = 20$ for x. Start by isolating the variable term by adding 8 to both sides of the equation: $4x - 8 + 8 = 20 + 8$, which simplifies to $4x = 28$. Now divide both sides by 4 to solve for x: $4x/4 = 28/4$, so $x = 7$. You can verify this is correct by substituting $x = 7$ back into the original equation: $4(7) - 8 = 28 - 8 = 20$, which matches the right side of the equation.

4. A. The question asks for the slope of the line passing through points (2, 5) and (6, 13). Use the slope formula: $m = (y_2 - y_1)/(x_2 - x_1)$, where (x_1, y_1) and (x_2, y_2) are the two points. Let (2, 5) be the first point and (6, 13) be the second point. Substitute these values into the formula: $m = (13 - 5)/(6 - 2) = 8/4 = 2$. The slope of the line is 2.

5. C. The question asks for the y-intercept of the equation $y = 3x - 4$. This equation is written in slope-intercept form, which is $y = mx + b$, where m represents the slope and b represents the y-intercept. In the equation $y = 3x - 4$, we can identify that 3 is the slope (m) and -4 is the y-intercept (b). The y-intercept is the point where the line crosses the y-axis, which occurs when $x = 0$. The y-intercept is -4.

6. B. The question asks you to find 35% of 80. To calculate a percentage of a number, convert the percentage to a decimal by dividing by 100: $35\% = 35/100 = 0.35$. Then multiply this decimal by the number: $0.35 \times 80 = 28$. Therefore, 35% of 80 equals 28.

7. D. The question asks for the area of a rectangle with length 12 inches and width 5 inches. The formula for the area of a rectangle is: Area = length × width. Substitute the given dimensions into the formula: Area = $12 \times 5 = 60$. The area is 60 square inches.

8. A. The question asks you to evaluate the function $f(x) = 2x^2 - 3$ when $x = 4$. To find f(4), substitute 4 for every x in the function: $f(4) = 2(4)^2 - 3$. Following order of operations, calculate the exponent first: $4^2 = 4 \times 4 = 16$. Then multiply by 2: $2 \times 16 = 32$. Finally, subtract 3: $32 - 3 = 29$. The value of f(4) is 29.

9. C. The question asks for the value of $\sqrt{81} + \sqrt{16}$. You must calculate each square root separately before adding. First, find $\sqrt{81}$: since $9 \times 9 = 81$, we know that $\sqrt{81} = 9$. Next, find $\sqrt{16}$: since $4 \times 4 = 16$, we know that $\sqrt{16} = 4$. Now add these two results: $9 + 4 = 13$. The answer is 13.

10. B. The question asks for the probability of randomly selecting a blue marble from a bag containing 15 red, 20 blue, and 15 green marbles. First, determine the total number of marbles by adding all three colors: $15 + 20 + 15 = 50$ marbles total. Probability is calculated using the formula: P(event) = (favorable outcomes)/(total outcomes). For selecting a blue marble: $P(\text{blue}) = 20/50$. Simplify this fraction by dividing both the numerator and denominator by their greatest common factor, which is 10: $20/50 = 2/5$. The probability is 2/5.

11. D. The question gives you the equation $5x + 3y = 27$ and tells you that $x = 3$, asking you to find the value of y. Substitute 3 for x in the equation: $5(3) + 3y = 27$. Multiply 5 by 3: $15 + 3y = 27$. To isolate the term with y, subtract 15 from both sides: $3y = 27 - 15 = 12$. Now divide both sides by 3 to solve for y: $y = 12/3 = 4$. The value of y is 4.

12. A. The question asks for the distance between points (-1, 2) and (3, 5) on the coordinate plane. Use the distance formula: $d = \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$. Identify the coordinates: $(x_1, y_1) = (-1, 2)$ and $(x_2, y_2) = (3, 5)$. Substitute these values into the formula: $d = \sqrt{[(3 - (-1))^2 + (5 - 2)^2]} = \sqrt{[(3 + 1)^2 + (3)^2]} = \sqrt{[4^2 + 3^2]} = \sqrt{[16 + 9]} = \sqrt{25} = 5$. The distance between the two points is 5 units.

13. C. The question asks you to expand the expression $(x + 4)(x - 2)$. Use the FOIL method (First, Outer, Inner, Last) to multiply two binomials. First: multiply the first terms: $x \times x = x^2$. Outer: multiply the outer terms: $x \times (-2) = -2x$. Inner: multiply the inner terms: $4 \times x = 4x$. Last: multiply the last terms: $4 \times (-2) = -8$. Now combine all terms: $x^2 - 2x + 4x - 8$. Combine like terms ($-2x + 4x = 2x$): $x^2 + 2x - 8$. The equivalent expression is $x^2 + 2x - 8$.

14. B. The question states that a circle has a diameter of 14 centimeters and asks for its radius. The radius of a circle is half the diameter. To find the radius, divide the diameter by 2: radius = 14/2 = 7 centimeters. The radius is 7 centimeters.

15. D. The question asks you to solve the inequality $2x - 5 > 11$ for x. Solve this just like an equation, but remember to maintain the inequality sign. First, add 5 to both sides to isolate the term with x: $2x - 5 + 5 > 11 + 5$, which gives $2x > 16$. Now divide both sides by 2: $2x/2 > 16/2$, so $x > 8$. This means x must be greater than 8. Any value larger than 8 will satisfy this inequality.

16. A. The question asks for the median of the data set: 12, 8, 15, 10, 8, 20. To find the median, first arrange the numbers in order from smallest to largest: 8, 8, 10, 12, 15, 20. Since there are 6 numbers (an even count), the median is the average of the two middle values. The middle two values are the 3rd and 4th numbers: 10 and 12. Calculate their average: $(10 + 12)/2 = 22/2 = 11$. The median is 11.

17. C. The question asks you to evaluate $a^2 + 2a - 5$ when $a = -3$. Substitute -3 for a in the expression: $(-3)^2 + 2(-3) - 5$. Calculate the exponent first: $(-3)^2 = (-3) \times (-3) = 9$. Remember that a negative number squared becomes positive. Next, multiply 2 by -3: $2 \times (-3) = -6$. Now combine all terms: $9 + (-6) - 5 = 9 - 6 - 5$. Calculate left to right: $9 - 6 = 3$, then $3 - 5 = -2$. The answer is -2.

18. B. The question states that a triangle has angles measuring 45°, 65°, and x°, and asks for the value of x. The sum of all angles in any triangle always equals 180°. Set up an equation: $45 + 65 + x = 180$. Add the known angles: $110 + x = 180$. Subtract 110 from both sides to solve for x: $x = 180 - 110 = 70$. The measure of angle x is 70°.

19. D. The question asks for the value of 4^3 (4 to the third power). An exponent indicates how many times to multiply the base by itself. 4^3 means $4 \times 4 \times 4$. Calculate step by step: first, $4 \times 4 = 16$. Then multiply that result by 4 again: $16 \times 4 = 64$. The value of 4^3 is 64.

20. A. The question asks you to solve $3(x + 2) = 18$ for x. First, divide both sides by 3 to eliminate the coefficient: $(3(x + 2))/3 = 18/3$, which simplifies to $x + 2 = 6$. Now subtract 2 from both sides: $x = 6 - 2 = 4$. The value of x is 4. You can verify by substituting back: $3(4 + 2) = 3(6) = 18$ ✓.

21. C. The question asks for the perimeter of a square with side length 9 meters. A square has four equal sides, so the perimeter is calculated by adding all four sides or multiplying the side length by 4. Perimeter = 4 × side length = $4 \times 9 = 36$ meters. The perimeter is 36 meters.

22. B. The question asks you to simplify the expression $5x - 2x + 7x$. These are like terms (all contain the variable x), so you can combine them by adding or subtracting the coefficients. Combine the coefficients: $5 - 2 + 7 = 10$. Keep the variable x: 10x. The simplified expression is 10x.

23. D. The question states that y varies directly with x, and gives you one pair of values: $y = 15$ when $x = 3$. You need to find y when $x = 8$. Direct variation means $y = kx$, where k is the constant of variation. First, find k using the given values: $15 = k(3)$, so $k = 15/3 = 5$. Now use this constant to find y when $x = 8$: $y = 5(8) = 40$. The value of y is 40.

24. A. The question asks for the area of a circle with radius 4 inches, using $\pi \approx 3.14$. The formula for the area of a circle is $A = \pi r^2$, where r is the radius. Substitute $r = 4$ and $\pi = 3.14$: $A = 3.14 \times (4)^2 = 3.14 \times 16$. Multiply: $3.14 \times 16 = 50.24$. The area is 50.24 square inches.

25. C. The question asks you to solve the absolute value equation $|2x - 4| = 10$ for all possible values of x. An absolute value equation has two cases because the expression inside can equal either the positive or negative value. Case 1: $2x - 4 = 10$. Add 4 to both sides: $2x = 14$. Divide by 2: $x = 7$. Case 2: $2x - 4 = -10$. Add 4 to both sides: $2x = -6$. Divide by 2: $x = -3$. The two solutions are $x = -3$ and $x = 7$.

26. B. The question asks for the average speed of a car that travels 240 miles in 4 hours. Average speed is calculated using the formula: average speed = total distance/total time. Substitute the given values: average speed = 240 miles/4 hours = 60 miles per hour. The average speed is 60 mph.

27. D. The question asks for the value of $\sin(30°)$. This is a standard trigonometric value that you should memorize for the ACT. The sine of 30° equals 1/2. This comes from the properties of a 30-60-90 triangle, where the sides are in the ratio $1:\sqrt{3}:2$. The sine of an angle equals the opposite side over the hypotenuse, so $\sin(30°) = 1/2$.

28. A. The question states that a right triangle has sides measuring 6, 8, and 10, and asks for the length of the hypotenuse. In a right triangle, the hypotenuse is the longest side, which is opposite the right angle. Among the three given sides, 10 is the largest, so the hypotenuse is 10. You can verify this is a right triangle using the Pythagorean theorem: $6^2 + 8^2 = 36 + 64 = 100 = 10^2$ ✓. This is a 3-4-5 Pythagorean triple scaled by 2.

29. C. The question asks you to simplify the expression $3(2x + 5) - 4$. First, distribute the 3 to both terms inside the parentheses: $3 \times 2x = 6x$ and $3 \times 5 = 15$, giving you $6x + 15$. Now subtract 4 from this result: $6x + 15 - 4 = 6x + 11$. The simplified expression is $6x + 11$.

30. B. The question asks for the value of $\log_2(32)$. A logarithm answers the question: "To what power must the base be raised to get the given number?" In other words, $\log_2(32)$ asks "2 to what power equals 32?" Calculate powers of 2: $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$. Since $2^5 = 32$, we know that $\log_2(32) = 5$.

31. D. The question asks for the volume of a cube with edges of length 3 centimeters. The volume of a cube is calculated using the formula: $V = \text{edge}^3$, where the edge length is cubed (multiplied by itself three times). Substitute the edge length: $V = 3^3 = 3 \times 3 \times 3 = 27$. The volume is 27 cubic centimeters.

32. A. The question asks you to evaluate the function $f(x) = x^2 - 5x + 6$ when $x = 0$. Substitute 0 for x in the function: $f(0) = (0)^2 - 5(0) + 6$. Calculate each term: $0^2 = 0$, $5 \times 0 = 0$. This leaves: $f(0) = 0 - 0 + 6 = 6$. The value of f(0) is 6.

33. C. The question asks for the sum of the interior angles of a hexagon. Use the formula for the sum of interior angles of a polygon: $\text{Sum} = (n - 2) \times 180°$, where n is the number of sides. A hexagon has 6 sides, so substitute $n = 6$: $\text{Sum} = (6 - 2) \times 180° = 4 \times 180° = 720°$. The sum of the interior angles is 720°.

34. B. The question asks which equation represents a line perpendicular to $y = 2x + 3$. Two lines are perpendicular if their slopes are negative reciprocals of each other. The original line has slope 2 (the coefficient of x). The negative reciprocal of 2 is -1/2 (flip the fraction and change the sign). The equation $y = -½x + 4$ has slope -½, making it perpendicular to the original line.

35. D. The question asks you to solve $3^x = 81$ for x. You need to determine what power of 3 equals 81. Calculate powers of 3: $3^1 = 3$, $3^2 = 9$, $3^3 = 27$, $3^4 = 81$. Since $3^4 = 81$, we know that $x = 4$.

36. A. The question asks for the value of cos(60°). This is a standard trigonometric value from a 30-60-90 triangle. In such a triangle, the sides are in the ratio $1:\sqrt{3}:2$. Cosine equals adjacent/hypotenuse. For a 60° angle in a 30-60-90 triangle, the adjacent side is 1 and the hypotenuse is 2, so $\cos(60°) = 1/2$.

37. C. The question asks for the volume of a rectangular prism with dimensions 4 cm × 5 cm × 6 cm. The volume of a rectangular prism is calculated using the formula: V = length × width × height. Multiply all three dimensions: $V = 4 \times 5 \times 6$. Calculate step by step: $4 \times 5 = 20$, then $20 \times 6 = 120$. The volume is 120 cubic centimeters.

38. B. The question gives you the sequence 5, 10, 20, 40, ... and asks for the 6th term. First, identify the pattern. Each term is obtained by multiplying the previous term by 2: $5 \times 2 = 10$, $10 \times 2 = 20$, $20 \times 2 = 40$. This is a geometric sequence with first term 5 and common ratio 2. Continue the pattern: the 5th term is $40 \times 2 = 80$, and the 6th term is $80 \times 2 = 160$. The 6th term is 160.

39. D. The question asks for the slope of a line perpendicular to a line with slope 3. Perpendicular lines have slopes that are negative reciprocals of each other. To find the negative reciprocal of 3 (which is 3/1), flip the fraction to get 1/3, then change the sign to get -1/3. The slope of the perpendicular line is -1/3.

40. A. The question gives you the equation $2x + 3y = 18$ with $x = 6$, and asks for the value of y. Substitute 6 for x in the equation: $2(6) + 3y = 18$. Multiply: $12 + 3y = 18$. Subtract 12 from both sides: $3y = 18 - 12 = 6$. Divide both sides by 3: $y = 6/3 = 2$. The value of y is 2.

41. C. The question asks for the midpoint of the line segment connecting (-2, 4) and (6, 10). Use the midpoint formula: midpoint = $((x_1 + x_2)/2, (y_1 + y_2)/2)$. Substitute the coordinates: midpoint = $((-2 + 6)/2, (4 + 10)/2) = (4/2, 14/2) = (2, 7)$. The midpoint is (2, 7).

42. B. The question asks for the volume of a cylinder with radius 3 inches and height 8 inches, using $\pi \approx 3.14$. The formula for the volume of a cylinder is $V = \pi r^2 h$. Substitute the values: $V = 3.14 \times (3)^2 \times 8 = 3.14 \times 9 \times 8$. Calculate step by step: $9 \times 8 = 72$, then $3.14 \times 72 = 226.08$. The volume is 226.08 cubic inches.

43. D. The question asks you to solve the quadratic equation $x^2 - 9x + 20 = 0$. Factor the quadratic by finding two numbers that multiply to 20 and add to -9. Those numbers are -4 and -5 because $(-4) \times (-5) = 20$ and $(-4) + (-5) = -9$. Factor: $(x - 4)(x - 5) = 0$. Set each factor equal to zero: $x - 4 = 0$ gives $x = 4$, and $x - 5 = 0$ gives $x = 5$. The solutions are $x = 4$ and $x = 5$.

44. A. The question asks for the value of tan(45°). This is a standard trigonometric value. In a 45-45-90 triangle (an isosceles right triangle), the two legs are equal. Since tangent equals opposite/adjacent, and both legs are equal, tan(45°) = 1/1 = 1.

45. C. The question asks for the equation of a line passing through point (3, -2) with slope 4, in slope-intercept form (y = mx + b). Use the point-slope form first: $y - y_1 = m(x - x_1)$. Substitute the point (3, -2) and slope 4: y - (-2) = 4(x - 3). Simplify: y + 2 = 4x - 12. Subtract 2 from both sides to get slope-intercept form: y = 4x - 12 - 2 = 4x - 14. The equation is y = 4x - 14.

Reading

1. B. The opening paragraph describes the narrator's initial reaction to entering the house. The text states "The key turned stiffly in the lock, resisting my efforts the way the house itself seemed to resist my return" and "I hadn't been back to my grandmother's house in fifteen years—not since her funeral, not since the day I'd sworn to myself that I was done with this place." These details establish that the narrator is reluctant to be there. However, she is present because she's been asked to clear out the house, as indicated by her mother's letter saying "You should be the one to clear it out." This combination of reluctance (not wanting to be there) and obligation (being asked to handle this responsibility) characterizes her initial reaction. The narrator is doing something she doesn't particularly want to do but feels she must.

2. G. The passage directly addresses this question in the second paragraph. The narrator's mother sent her the keys with a note that read: "You should be the one to clear it out...You were always her favorite." The text explicitly states this as the reason the mother gave for why the narrator should handle clearing out the house. The statement is followed by "The words had stung more than she'd probably intended," suggesting complexity in the family dynamics, but the direct answer to why the mother suggested the narrator clear the house is that the narrator had been identified as the grandmother's favorite.

3. C. The water ring incident serves as an example of the grandmother's character and approach to relationships. The narrator describes feeling guilty about leaving the water ring on the piano for weeks, expecting anger or punishment. However, the grandmother never mentioned it, and years later explained: "We could refinish it, or we could leave it as evidence that you were here. I prefer the evidence." This response demonstrates the grandmother's forgiveness (not being angry about the damage) and her acceptance (valuing signs of her granddaughter's presence over the pristine condition of the piano). The memory illustrates a moment where the grandmother chose connection over perfection, which shapes the narrator's understanding of their relationship.

4. H. The grandmother's statement "I prefer the evidence" reveals her values and priorities. In the context of the water ring discussion, she's saying that she would rather have evidence of her granddaughter's presence—even imperfect evidence that includes minor damage—than have a flawless piano without those traces of their time together. The statement indicates that she cherished and valued signs that her granddaughter had been there, had practiced piano, had been part of her life. The water ring became meaningful not as damage but as proof of their relationship and shared experiences.

5. A. The passage explicitly contrasts the two sisters' behaviors during summer visits. The text states: "Rachel would spend her days reading in the garden or exploring the woods behind the house. I would plant myself at the kitchen table and watch Grandma work." This directly establishes the primary difference: the narrator spent time with their grandmother in the kitchen while Rachel preferred solitary activities outdoors. The passage doesn't suggest Rachel was rebellious or that she was interested in gardening as an activity with their grandmother—rather, she read or explored alone while the narrator engaged with their grandmother through cooking and conversation.

6. J. The grandmother's statement "Cooking is translation" is explained through the examples she provides immediately after. She says: "You take ingredients—basic things, flour and water and salt—and you translate them into something else. You translate hunger into satisfaction, translate loneliness into community. Every meal is a conversation." This metaphor suggests that cooking transforms basic, simple elements (flour, water, salt) into something meaningful and significant (satisfaction, community, conversation). The concept emphasizes transformation—taking fundamental ingredients and turning them into experiences that fulfill physical, emotional, and social needs. Cooking becomes a process of changing raw materials into meaningful human experiences.

7. D. The discovery of the love letters marked a turning point in the narrator's relationship with her grandmother. The passage states that the narrator "loved those summers until I was fourteen, the summer everything changed." After discovering the letters and hearing her grandmother's matter-of-fact explanation of her lost love, the narrator saw her grandmother differently—as someone she perceived as tragic rather than content. The text explicitly connects this discovery to the narrator's subsequent absence: "That conversation had stayed with me, though I hadn't fully understood it then. I'd gone home at the end of that summer and somehow never managed to come back." The discovery created a new perception of her grandmother that the teenage narrator found troubling, contributing to the emotional distance that kept her from returning. While the grandmother viewed herself as someone who "built a different life" and lived "with choices," the narrator couldn't reconcile this perspective at fourteen, and this disconnect contributed to her staying away.

8. F. The grandmother's statement distinguishes between two ways of relating to the past. "Living with memories" suggests a passive relationship with the past—dwelling on what was lost, being defined by bygone experiences. "Living with choices" suggests active engagement—making deliberate decisions about how to live in the present. The grandmother is emphasizing that she didn't spend her life mourning her lost fiancé or being trapped by past sorrows. Instead, she actively built a life through deliberate choices: her work, her home, her garden, her relationships with her granddaughters. She's stressing agency and present engagement rather than passive nostalgia or regret. The statement reflects her philosophy of active living despite loss, rather than being defined by loss.

9. B. The passage explicitly describes the source of the narrator's tears: "Not crying for her—she'd lived ninety-three years and died peacefully in her sleep, and she'd have called it greedy to want more than that. I was crying for myself, for all the summers I'd missed, for all the conversations I'd been too proud or too busy to have, for the translation lessons I'd failed to learn." The narrator clearly states she's not crying out of grief for her grandmother's death itself, but rather crying about missed opportunities—the visits she didn't make, the conversations she didn't have, the lessons she failed to absorb. The tears come from recognizing what she lost through her own absence and understanding too late what her grandmother had been trying to teach her.

10. H. The passage opens by describing the traditional view: "Procrastination is often viewed as a failure of willpower, a character flaw that reflects poor time management or simple laziness." This sentence directly characterizes the conventional understanding of procrastination as a moral or character issue involving weakness, poor discipline, and laziness. The passage then goes on to challenge this traditional view with research showing procrastination is actually more complex, but the question asks specifically about what the traditional view holds, and the answer is clearly stated in the opening sentence.

11. C. The passage provides specific statistics about chronic procrastinators in the second paragraph: "Studies estimate that between 15% and 20% of adults are chronic procrastinators, meaning they consistently delay tasks across multiple life domains." The definition is provided immediately after the statistic—chronic procrastinators are those who consistently delay tasks across multiple areas of life, not just occasionally or in limited contexts. The passage distinguishes chronic procrastinators from the nearly everyone who "procrastinates at least occasionally," establishing that chronic procrastination is a persistent pattern rather than occasional behavior.

12. F. Dr. Timothy Pychyl's perspective is clearly stated in the third paragraph: "Dr. Timothy Pychyl, a researcher at Carleton University who has studied procrastination for over two decades, argues that procrastination is fundamentally about emotion regulation." The passage then elaborates: "When we face a task, we don't just evaluate its importance or urgency. We also have an immediate emotional reaction to it...Procrastination, from this perspective, is a way of avoiding these negative emotions in the present moment." Pychyl's research reframes procrastination as primarily an emotional issue—specifically about managing or avoiding negative emotions that tasks trigger—rather than fundamentally about time management or discipline.

13. B. The passage addresses this puzzle in the fourth paragraph: "This explains one of procrastination's most puzzling features: we often procrastinate even when we know we're making things worse for ourselves...But in the moment of decision, the immediate relief from anxiety outweighs the abstract future cost. Procrastination provides temporary mood repair—a brief escape from unpleasant emotions—at the expense of long-term well-being." The explanation is that even though people rationally understand the future negative consequences, the immediate emotional relief from avoiding the task feels more compelling in the present moment than the abstract knowledge of future problems. The present relief outweighs the future cost in the moment of decision-making.

14. J. The passage describes brain imaging research findings: "Research using fMRI technology shows that when people contemplate tasks they're inclined to delay, they show heightened activity in the amygdala, the brain's threat-detection center, and reduced activity in the prefrontal cortex regions associated with impulse control and long-term planning." This describes two simultaneous patterns: increased amygdala activity (the threat response) and decreased prefrontal cortex activity (the planning and impulse control regions). These opposing patterns explain why procrastination occurs—the emotional threat response increases while the executive control decreases.

15. D. Dr. Fuschia Sirois's research on self-compassion is explained: "Dr. Fuschia Sirois, a researcher at the University of Sheffield, has found that self-compassion—treating oneself with kindness rather than harsh self-criticism—can reduce procrastination...But self-criticism tends to increase the negative emotions that drive procrastination. Feeling ashamed or guilty about procrastinating often leads to more procrastination as people seek to escape these uncomfortable feelings. Self-compassion, by contrast,

reduces the emotional intensity of confronting our delayed tasks, making it easier to begin." The mechanism is clear: self-compassion reduces the emotional intensity and negative feelings associated with facing delayed tasks, making it less emotionally threatening to begin working on them. This contrasts with self-criticism, which intensifies negative emotions and makes the task even more aversive.

16. G. The passage defines temporal discounting clearly: "Another promising approach involves what psychologists call 'temporal discounting'—the tendency to value immediate rewards more heavily than future rewards." The definition is straightforward: it's the human tendency to weight present benefits more heavily than future benefits, even when the future benefits might be objectively larger. The passage explains that procrastinators show particularly steep temporal discounting, meaning they especially struggle with valuing future outcomes compared to immediate experiences.

17. A. The passage distinguishes between procrastination and strategic delay: "Importantly, not all delay is procrastination. Intentional delay can be a form of strategic prioritization. If you postpone one task to complete something more urgent or important, that's effective time management, not procrastination. The key distinction is whether the delay is purposeful or driven by avoidance." The critical difference is intentionality and motivation: strategic delay involves conscious, purposeful decisions about priorities, while procrastination involves avoiding tasks due to emotional discomfort despite wanting or intending to complete them. The distinction hinges on whether the delay serves a deliberate purpose or stems from emotional avoidance.

18. H. The passage explains cultural differences in procrastination rates: "Research suggests that procrastination rates are highest in individualistic cultures like the United States and Western Europe, and lower in more collectivist cultures. This difference might relate to how tasks are framed. In individualistic cultures, tasks are often seen as personal responsibilities; failure to complete them reflects on individual competence, triggering more anxiety and avoidance. In collectivist cultures, tasks might be framed more as contributions to group goals, potentially reducing the individual emotional burden." The explanation is that in individualistic cultures, tasks carry more personal weight—they reflect directly on individual competence and identity—which triggers more anxiety and emotional response. This framing increases the emotional stakes of tasks, making them more anxiety-provoking and more likely to be avoided through procrastination.

19. C. The passage's opening paragraph establishes jazz's origins: "Jazz emerged in the early twentieth century from a cultural crossroads—the collision and fusion of African musical traditions, European harmonic structures, and the uniquely American experience of racial segregation and urbanization." This sentence directly identifies three contributing elements: African musical traditions (brought by enslaved people), European harmonic structures (from Western classical music), and the specific American context (including urbanization and racial dynamics). The passage emphasizes that jazz was a synthesis, a fusion of multiple traditions rather than emerging from any single source.

20. G. The second paragraph describes African musical influences: "Enslaved Africans brought to America musical traditions that emphasized rhythm, call-and-response patterns, and improvisation—elements largely absent from European classical music." These three elements—rhythm, call-and-response, and improvisation—are explicitly listed as the key characteristics of African musical traditions that influenced jazz's development. The passage contrasts these elements with European classical music,

which didn't emphasize these same features, making them distinctive contributions from African traditions.

21. B. The passage explains why New Orleans was uniquely suited for jazz's development: "New Orleans proved to be the perfect incubator for this new music. The city's unique culture—a French and Spanish colonial history, a significant free Black population even before the Civil War, and a Catholic tolerance for secular pleasures—created space for musical experimentation that didn't exist in other American cities." The key phrase is "created space for musical experimentation"—New Orleans' particular cultural characteristics (its colonial history, demographics, and religious tolerance) allowed for artistic experimentation and musical fusion that wasn't possible in other American cities at that time. The passage emphasizes the city's cultural openness and diversity as enabling factors.

22. F. The passage describes Louis Armstrong's revolutionary contribution: "Armstrong, in particular, revolutionized jazz in the 1920s by shifting emphasis from collective improvisation (where multiple musicians improvised simultaneously) to solo improvisation. His recordings with the Hot Five and Hot Seven demonstrated that jazz could be a virtuosic art form, with individual musicians crafting complex, emotionally powerful statements within the structure of a song." Armstrong's key innovation was changing the focus from the early New Orleans style where musicians improvised together to a new model where individual musicians took solo turns, demonstrating jazz as a vehicle for personal virtuosic expression. This shift fundamentally changed how jazz was performed and understood.

23. D. The passage explains Ellington's compositional approach: "Ellington composed thousands of pieces, from three-minute dance numbers to extended suites, always writing for the specific talents of his band members. He understood that jazz wasn't just about following chord changes or technical proficiency—it was about voice, about each musician bringing their unique personality into the music. An Ellington composition written for Johnny Hodges's alto saxophone couldn't be played the same way by anyone else, because it was written for Hodges's specific sound, phrasing, and emotional palette." Ellington's distinctive approach was composing specifically for individual musicians' unique characteristics—their particular sound, style, and personality—rather than writing generic parts that any musician could play. His compositions were tailored to showcase the specific qualities of his band members.

24. H. The passage explains bebop musicians' motivations: "Bebop musicians were making a statement: jazz was art music, deserving of the same serious attention as classical music...The music's complexity—rapid chord changes, angular melodies, intricate rhythmic patterns—required dedicated listening...They rejected the entertainment role that White-dominated society had assigned to Black musicians. They asserted their intellectual and creative equality through music so sophisticated that it couldn't be dismissed or patronized." The complexity of bebop was intentional—it was a deliberate assertion of artistic and intellectual equality. By creating music that was undeniably sophisticated and demanding, bebop musicians challenged the racist assumptions that relegated Black musicians to mere entertainers, asserting instead their equality as serious artists and intellectuals.

25. A. The passage presents the criticism of bebop: "Some critics argued that bebop alienated jazz from its popular roots, turning it into an elitist art form." The specific criticism was that bebop became elitist—too complex, too intellectually demanding, no longer accessible to popular audiences who had enjoyed earlier jazz styles. Critics felt that bebop's sophistication and its shift away from dance music made it an

exclusive art form rather than popular entertainment, disconnecting it from the wider audience that had embraced swing-era jazz.

26. J. The passage explains the democratic nature of jazz: "More broadly, jazz represented a model of democratic art-making. A jazz performance is a conversation where musicians listen to each other, respond to each other, build on each other's ideas. The traditional jazz emphasis on 'comping'—supporting and responding to a soloist—requires deep listening and collaborative creativity. Everyone gets a turn to speak (to solo), but the ensemble matters more than any individual." Jazz is democratic in its structure and practice—musicians collaborate through listening and responding, everyone contributes and takes turns, and the collective result matters more than any individual's contribution. This collaborative, conversational nature makes it analogous to democratic dialogue and decision-making.

27. C. The passage's conclusion emphasizes: "But understanding jazz history is essential for understanding American history. Jazz tells the story of how oppressed people created beauty from struggle, how artistic innovation happens through cultural fusion, and how music can be both entertainment and high art, both deeply rooted in tradition and radically innovative. It reminds us that America's greatest cultural contributions have often come from its most marginalized communities." The passage argues that jazz history matters because it reveals how marginalized and oppressed communities—specifically Black Americans—created some of America's most significant cultural achievements despite facing discrimination and violence. Jazz history demonstrates that major cultural innovations often come from those whom society has tried to marginalize, making it essential for understanding both American cultural history and the contributions of oppressed communities.

28. F. The passage begins by describing the outdated model: "For decades, scientists conceptualized memory as relatively straightforward: experiences create memories, which are then stored like files in a cabinet, ready to be retrieved when needed. This storage model, though intuitively appealing, has proven to be fundamentally incorrect." The traditional storage model explicitly compared memory to files in a cabinet—a straightforward system where memories are stored in a fixed form and simply retrieved when needed, like pulling a file folder from storage. The passage then explains that this model is incorrect and that memory is actually far more dynamic and reconstructive.

29. B. The passage explains attention's role in the second paragraph: "But not all experiences become lasting memories. The brain constantly receives far more sensory information than it could possibly store, so it must be selective. Attention plays a crucial role here: experiences you pay attention to are far more likely to be encoded into memory than those that pass unnoticed." Attention functions as a filter or selection mechanism—because the brain cannot possibly store all incoming sensory information, attention determines which experiences get encoded into memory. What you pay attention to has a much higher likelihood of being remembered than what you ignore or don't notice.

30. H. The passage describes consolidation timing: "The process of consolidation takes encoded memories and stabilizes them for long-term storage. Immediately after an experience, the memory trace is fragile and susceptible to disruption. Consolidation, which occurs primarily during sleep, strengthens these memory traces by repeatedly reactivating the neural patterns that formed during the initial experience. This is why sleep is so critical for learning—during sleep, particularly during slow-wave sleep and REM sleep, the brain replays experiences, strengthening the connections between neurons that form memory

traces." The passage explicitly states that consolidation happens primarily during sleep, especially during slow-wave and REM sleep phases, when the brain reactivates and strengthens memory traces.

31. D. The passage explains reconsolidation's function: "Each time you remember something, you reactivate the neural patterns that constitute that memory. This reactivation makes the memory temporarily unstable again, requiring a process called reconsolidation to restabilize it. This might seem inefficient, but it serves an important function: it allows memories to be updated with new information. When you remember a childhood birthday party, for instance, that memory might be updated with new contexts or associations, becoming richer and more connected to other knowledge." Reconsolidation allows memories to be flexible and updateable—each time you remember something, the memory can incorporate new information, contexts, or associations, making it richer and more integrated with current knowledge. This updating function is the key purpose of reconsolidation.

32. G. The passage describes Elizabeth Loftus's research: "In one famous series of experiments, she showed participants photographs of a car accident and then asked leading questions about what they'd seen. Participants who were asked 'How fast were the cars going when they smashed into each other?' later 'remembered' seeing broken glass at the scene, even though no broken glass appeared in the photographs. The leading question altered their memory of the event." The experiment demonstrated that the way questions are phrased—specifically, using leading questions with suggestive language—can actually change what people remember about events they witnessed. The word "smashed" in the question led participants to falsely remember broken glass, showing that memory can be altered through suggestion.

33. A. The passage explains memory reconstruction: "The constructive nature of memory becomes even more apparent when we consider how memories of different elements of an experience are stored separately. When you remember meeting someone at a party, the visual information (what they looked like), auditory information (their voice), emotional information (how you felt), and contextual information (where you were, who else was there) are stored in different brain regions. When you recall that meeting, your brain reconstructs the experience by pulling together information from these separate storage sites." Memory is not stored as a single unified file; instead, different aspects (visual, auditory, emotional, contextual) are stored in different brain regions, and when you remember, your brain pulls together these separately-stored elements to reconstruct the memory. This distributed storage and active reconstruction is fundamental to how memory works.

34. J. The passage contrasts different memory types: "Procedural memory—memory for skills and how to do things—relies on different brain structures entirely, including the basal ganglia and cerebellum, which is why you can remember how to ride a bicycle even if you can't remember when you learned." The key distinction is that procedural memory uses different neural structures (basal ganglia and cerebellum) compared to other types of memory. The passage earlier established that episodic memory depends critically on the hippocampus, making the point that different memory types literally use different parts of the brain.

35. C. The passage describes patient H.M.'s case: "Damage to the hippocampus, from injury or disease, typically prevents the formation of new long-term memories while leaving older memories relatively intact. The famous case of patient H.M., who had portions of his hippocampus removed to treat epilepsy, revealed this function. After surgery, H.M. could still remember his childhood and events from years before the operation, but he couldn't form new episodic memories. He would forget conversations minutes

after they ended, couldn't remember people he met after surgery, and had no memory of the surgery itself." H.M.'s case demonstrated that hippocampal damage prevents forming new episodic memories (he couldn't remember new experiences after surgery) while preserving older memories formed before the damage (he still remembered his childhood and pre-surgery life). This dissociation revealed the hippocampus's specific role in creating new episodic memories.

36. F. The passage explains the link between memory and imagination: "Interestingly, memory isn't only about the past; it's also crucial for imagining the future. Brain imaging studies show that remembering past experiences and imagining future scenarios activate remarkably similar brain networks. This makes sense when you consider that imagining the future requires recombining elements from past experiences in new ways. If you're planning a beach vacation, your brain draws on memories of previous beach trips, other vacations, beaches you've seen in media, and more, combining these elements to simulate possible future experiences." Memory and future imagination are linked because imagining the future requires taking elements from past experiences and recombining them in new configurations. You can't imagine future scenarios without drawing on components from your stored past experiences—your brain uses memory as the raw material for constructing possible futures.

Science

1. B. The question asks which wheels produced the fastest times. Looking at the three studies, Study 3 with hard rubber wheels with studs imbedded in them produced the fastest average speed of 6.44 ft/s (average time of 11.7 seconds). Study 1 with hard rubber wheels with deep treads averaged 3.28 ft/s (22.8 seconds), and Study 2 with soft rubber wheels averaged 1.32 ft/s (56.7 seconds). The studded wheels were clearly fastest.

2. H. The question asks about the average speed in Study 1 compared to individual trials. Looking at Table 1, the average speed was 3.28 ft/s. Trial 1 measured 3.28 ft/s (equal to average), Trial 2 measured 3.23 ft/s (less than average), and Trial 3 measured 3.33 ft/s (greater than average). The average speed of 3.28 ft/s is greater than the speed measured in Trial 2 (3.23 ft/s).

3. D. The question asks which statement is best supported by all three studies. The average speed with studded wheels (Study 3) was 6.44 ft/s, and the average speed with deeply treaded wheels (Study 1) was 3.28 ft/s. Calculating the ratio: 6.44 ÷ 3.28 = approximately 1.96, which is approximately 2. Therefore, studded wheels produced approximately twice the speed of deeply treaded wheels. The other comparisons don't match the data.

4. F. The question asks what probably caused the higher average speeds. The passage describes testing different wheel types on the same surface under controlled conditions. The studs imbedded in the wheels (Study 3) would create greater friction with the surface, allowing better traction and higher speeds. Temperature was held constant at 20°F, eliminating choice (G). The study was conducted indoors, eliminating choice (H). The consistent results across trials rule out statistical error (J).

5. A. The question asks which trial had the slowest travel time (longest time to complete the course). Study 2, Trial 1 recorded 57 seconds, which is the longest time among all trials across all three studies. Study 2,

Trial 2 was 56.4 seconds, Study 3, Trial 1 was 11.3 seconds, and Study 1, Trial 2 was 23.2 seconds. The slowest time was 57 seconds in Study 2, Trial 1.

6. J. The question asks for the major point of difference between the two scientists. Scientist 1 argues that "Pluto is most certainly a planet" and provides evidence for why Pluto meets the definition of a planet. Scientist 2 argues that Pluto "is actually not a planet but a member of the Kuiper Belt." The fundamental disagreement is about whether Pluto should be classified as a planet or not.

7. B. Scientist 2 states: "Pluto is composed of icy material, as are the comets in the Kuiper Belt, while the other planets of the solar system fall into one of two categories: rocky or gaseous...Pluto is neither rocky nor gaseous but has an icy composition." This indicates that compared to other planets (which are either rocky or gaseous), Pluto's surface is more icy.

8. F. The question asks which way Pluto does NOT differ from asteroids and comets according to Scientist 1. Scientist 1 states: "Pluto does not generate heat by nuclear fission, distinguishing it from a star." This means Pluto shares this characteristic with asteroids and comets (not generating nuclear fission), so it doesn't distinguish Pluto from them. Scientist 1 does cite Pluto's spherical shape (G), lack of dust/gas tail (H), and larger size (J) as differences from asteroids and comets.

9. B. The question presents new evidence that Pluto has a rocky surface similar to Mars (when ice caps melt). This would weaken Scientist 2's position, which argues that Pluto is icy like Kuiper Belt comets, not rocky like the inner planets. If Pluto actually has a rocky surface beneath the ice, this undermines Scientist 2's claim that Pluto's icy composition distinguishes it from rocky planets. This finding would not weaken Scientist 1's position, as Scientist 1 focuses on size, orbit, and spherical shape rather than surface composition.

10. J. The question asks what both scientists would agree on. Both scientists acknowledge that Pluto's orbit is unusual. Scientist 1 mentions "Pluto's orbital path is irregular as compared with the other planets." Scientist 2 discusses "the eccentricity of Pluto's orbit" and notes that "for twenty years of its 249 year orbit, it is actually closer to the sun than is Neptune." Both agree the orbit is different from other planets.

11. A. The question asks what would weaken Scientist 1's viewpoint. Scientist 1 argues that Pluto's large size (1,413 mile diameter, "almost 1,000 times bigger than an average comet") distinguishes it from comets. If scientists discovered a Kuiper Belt comet with a radius of almost 1,500 miles (diameter of 3,000 miles), this would show that comets can be as large as or larger than Pluto, undermining Scientist 1's size-based argument for Pluto being a planet rather than a comet.

12. H. The question asks how Scientist 2 compares Pluto to Kuiper Belt comets. Scientist 2 states: "Finally, the eccentricity of Pluto's orbit indicates that it is not a planet...This irregular orbit is shared by over seventy Kuiper Belt comets." Scientist 2 explicitly identifies the similar eccentric (irregular) orbital patterns as a commonality between Pluto and Kuiper Belt comets.

13. C. The question asks which substance's concentration varies least with temperature. Looking at Table 1, NaCl concentrations are: 37 (at 0°C), 37 (20°C), 38 (40°C), 38 (60°C), 39 (80°C), and 40 (100°C). The total change is only 3 g/100g H_2O across 100°C. Comparing to other substances: HCl varies from 83 to

43 (change of 40), NH_3 varies from 90 to 8 (change of 82), and KCl varies from 28 to 57 (change of 29). NaCl shows the least variation.

14. F. The question asks which substance matches a graph (graph not shown, but based on data). Looking at Table 1, HCl shows a decreasing relationship: concentrations go from 83 (0°C) down to 43 (100°C). HCl is the only substance that consistently decreases as temperature increases, which would be represented by a downward-sloping line on a graph.

15. C. The question asks about the general trend in solubility with temperature. Examining Table 1: some substances increase with temperature (KCl, $NaNO_3$, NH_4Cl increase), some decrease (HCl, NH_3 decrease), and one stays relatively constant (NaCl). The data show that behavior varies depending on the specific substance, but each substance shows a consistent trend (either increasing, decreasing, or staying constant). This matches choice (C) - varies, but there is a trend depending on the substance.

16. J. The question asks for HCl concentration at 70°C. Table 1 shows HCl at 60°C is 55 g/100g H_2O and at 80°C is 48 g/100g H_2O. The concentration at 70°C (halfway between 60°C and 80°C) would be approximately halfway between 55 and 48: (55 + 48)/2 = 51.5 g/100g H_2O.

17. D. The question asks for the minimum temperature needed to dissolve at least 50 grams of NH_4Cl in 100 g of water. Looking at Table 1 for NH_4Cl: at 40°C, concentration is 46 g (not enough); at 60°C, concentration is 55 g (sufficient). Since we need at least 50 g and the concentration at 40°C is only 46 g while at 60°C it's 55 g, the temperature must be between these values. Among the answer choices (25°C, 30°C, 35°C, 50°C), only 50°C falls in the range where we know the concentration would be sufficient.

18. H. The question asks which statement is best supported. Looking at Tables 1 and 2, older salt pans have larger mineral volumes: Salt pan D (21.0 million years old) has 12,150,000 km^3 of minerals, while Salt pan A (4.5 million years old) has only 2,000,000 km^3. The passage explains that endorheic basins collect water permanently (except for evaporation) and that this leads to high mineral concentration. Over more time, more water would have collected and evaporated, leaving more mineral deposits. This directly supports choice (H).

19. B. The question asks which graph best represents the relationship between mineral volume and age. Looking at Table 1, as age increases, mineral volume increases: 4.5 million years/2,000,000 km^3, 5.7 million years/4,500,000 km^3, 10.8 million years/5,700,000 km^3, and 21.0 million years/12,150,000 km^3. This is a positive correlation that would be represented by an upward-sloping graph. Without seeing the specific graphs, choice (B) should show this positive relationship.

20. J. The question asks if we can conclude Salt pan A contains more plant fossils than Salt pan D. The passage tells us that fossil remnants were found in each salt pan, and Table 2 shows the types and ages of fossils found, but nowhere does the passage provide information about the quantity or number of fossils found. We cannot make a conclusion about which salt pan has more fossils based on the data provided.

21. C. The question asks about the mineral volume of a salt pan older than 21 million years. Table 1 shows a clear pattern: as age increases, mineral volume increases. Salt pan D, at 21.0 million years old, has 12,150,000 km^3. A salt pan that formed more than 21 million years ago would have had even more time to accumulate minerals, so it would logically have a mineral volume greater than 12,150,000 km^3.

22. H. The question asks which salt pan would be most similar to one containing a 9.7-million-year-old fossilized plant. Looking at Table 2, the fossil ages are: Salt pan A (4.4 million years), Salt pan B (5.5 million years), Salt pan C (10.2 million years), and Salt pan D (19.9 million years). A 9.7-million-year-old fossil is closest to the 10.2-million-year-old fossil found in Salt pan C.

23. C. The question asks about the condensation temperature of gasoline. Table 1 shows gasoline condenses at 40–70°C. This range is greater than 20°C (since it starts at 40°C) but also greater than 40°C (since that's just the minimum). Among the choices, gasoline's condensation temperature is most accurately described as greater than 20°C.

24. J. The question asks which by-product condenses first in the fractionating tower. The passage explains that crude oil is heated to 600°C and vapors rise. As vapors cool and reach their condensation temperature, they turn to liquid. The residue has the highest condensation temperature (600°C), meaning it condenses while still very hot. As vapors rise and cool further, other products condense at lower temperatures.

25. C. The question asks what fractional distillation uses as raw material. The passage clearly states: "Petroleum, or crude oil, is refined by separating it into different by-products. This process is called fractional distillation" and "The crude oil is super-heated in the boiler to about 600°C." Crude oil is the starting material that gets separated into by-products.

26. F. The question asks where naptha (condensation point ~90°C) would be found. Looking at Table 1, gasoline condenses at 40–70°C and kerosene condenses at 100–120°C. A substance condensing at 90°C would fall between these two ranges, so naptha would be found between gasoline and kerosene in the fractionating tower.

27. A. The question asks at what temperature most crude oil is vaporized. The passage explicitly states: "The crude oil is super-heated in the boiler to about 600°C, which vaporizes the crude oil." The answer is directly given as 600°C.

28. G. The question asks what happens to condensation temperature as vapor rises in the tower. The passage explains that vapors rise and cool, condensing at different heights based on their condensation temperatures. As you go up the tower, the temperature decreases (it's cooler higher up). Products with lower condensation temperatures rise higher before condensing. Looking at Table 1, as you go from bottom to top of the tower, condensation temperatures go from 600°C (residue at bottom) down to 20-40°C (petroleum gas at top). The condensation temperature decreases as vapor rises.

29. B. The question asks which star most likely has no planets. The passage states: "if the paths of the X-rays are not bent in any way, it is assumed that the star lacks any planets." Looking at Table 1, Star 2 shows 0.00 meters of distortion on all four measured days (Day 1, 4, 7, and 10). Since there is no bending of X-rays, Star 2 most likely has no planets.

30. G. The question asks how many stars have at least one planet with a circular orbit. The passage explains that "A circular orbit produces increasing or decreasing distortions of the same level" - meaning consistent increases or decreases following a pattern. Looking at Table 1: Star 1 shows consistent increases (1.00, 1.75, 2.50, 3.25 - increasing by 0.75 each time), indicating a circular orbit. Star 3 shows consistent decreases (8.00, 4.00, 2.00, 1.00 - decreasing by half each time), also indicating a circular orbit. Star 2

shows no distortion (no planets). Star 4 shows random/irregular values (0.20, 0.10, 0.11, 0.11), indicating elliptical orbit. Two stars (Stars 1 and 3) have circular orbits.

31. A. The question asks which statement is best supported. The passage states: "high 'bending' in these rays would indicate the presence of large planets, while a low level of bending would most likely signify the presence of smaller planets." Star 3 shows the highest distortion values (8.00 meters on Day 1, the highest reading in the table), which indicates it is likely orbited by at least one large planet.

32. J. The question asks what distortion Star 1 would show on Day 13. Star 1 shows a consistent pattern of increase: 1.00 (Day 1), 1.75 (Day 4), 2.50 (Day 7), 3.25 (Day 10). The increase is 0.75 meters every 3 days. Continuing this pattern: Day 13 would be 3.25 + 0.75 = 4.00 meters.

33. A. The question asks which assumption could be true based on the passage. The entire passage is based on the premise that X-rays are distorted or bent by gravitational pull from planets. Gravitational pull is a physical force. Therefore, the passage assumes that X-rays are affected by certain physical forces (specifically gravity). This is the fundamental assumption underlying the entire detection method described.

34. G. The question asks which stars have at least one planet with an elliptical orbit. The passage states that "if...the pattern of bending is random...then the planet's orbit is elliptical." Looking at Table 1: Star 1 has a consistent increasing pattern (circular orbit). Star 2 has no bending (no planets). Star 3 has a consistent decreasing pattern (circular orbit). Star 4 has irregular/random values (0.20, 0.10, 0.11, 0.11) with no clear pattern, indicating an elliptical orbit. Only Star 4 shows the random pattern characteristic of elliptical orbits.

35. C. The question asks which category appears most frequently in Table 2. To answer this, we need to classify each bacterium in Table 2 according to the ranges in Table 1. Looking at the bacteria: Anoxybacillus flavithermus (30, 60, 72) = thermophile; Bacillus flavothermus (30, 60, 72) = thermophile; Clostridium perfringens (15, 45, 50) = mesophile; Escherichia coli (10, 37, 45) = mesophile; Listeria monocytogenes (1, 34, 45) = mesophile (minimum of 1 fits 5-25 range loosely, but optimum 34 and maximum 45 fit mesophile ranges); Micrococcus cryophilus (0, 15, 30) = psychrotroph; Staphylococcus aureus (10, 37, 45) = mesophile; Streptococcus pyogenes (20, 37, 40) = mesophile; Streptococcus pneumoniae (25, 37, 42) = mesophile. Counting: mesophile appears 6 times, making it the most frequent category.

36. G. The question asks which bacterium doesn't fit exactly into Table 1 categories. Listeria monocytogenes has growth points of minimum 1°C, optimum 34°C, and maximum 45°C. Looking at Table 1: psychrophile (minimum below 0), psychrotroph (minimum 0-5), mesophile (minimum 5-25), thermophile (minimum 25-45). Listeria's minimum of 1°C falls between psychrotroph (0-5) and mesophile (5-25) ranges, and its other values span multiple categories, making it not fit exactly into any single category.

37. C. The question states human body temperature is 40°C and asks which bacteria would grow most successfully. We need to find which bacterium has an optimum growth temperature closest to 40°C. Looking at Table 2 optimum temperatures: Anoxybacillus flavithermus (60°C), Clostridium perfringens (45°C), Escherichia coli (37°C), and Listeria monocytogenes (34°C). While none have exactly 40°C as

optimum, we should consider which can grow well at 40°C. E. coli has optimum 37°C and maximum 45°C, meaning 40°C is within its growth range and relatively close to its optimum. This would allow successful growth at body temperature.

38. J. The question describes a bacterium that reproduces best at 55°C with no growth above 65°C. Looking at Table 1, thermophiles have optimum growth at 50-60°C and maximum growth at 60-90°C. A bacterium with optimum at 55°C fits the thermophile optimum range, and maximum around 65°C fits within the thermophile maximum range (60-90°C). This bacterium would be classified as a thermophile.

39. C. The question asks which bacterium has the smallest growth range. Growth range = maximum temperature - minimum temperature. Calculating for each: Anoxybacillus (72-30=42), Bacillus (72-30=42), Clostridium (50-15=35), Escherichia (45-10=35), Listeria (45-1=44), Micrococcus (30-0=30), Staphylococcus (45-10=35), Streptococcus pyogenes (40-20=20), Streptococcus pneumoniae (42-25=17). Streptococcus pneumoniae has the smallest growth range of 17°C.

40. J. The question asks at what temperature Listeria monocytogenes stops reproducing. Table 2 shows Listeria monocytogenes has a maximum growth point of 45°C. The maximum growth point is defined as "the very highest temperature to which the bacteria will respond, beyond which the bacteria will not reproduce at all." Therefore, Listeria stops reproducing at temperatures greater than 45°C (>45°C).

Writing

The proposal to shift from a traditional five-day school week to a compressed four-day schedule forces us to confront a fundamental question: What is school actually for? If education exists solely to deliver content and skills, then the four-day model might succeed, provided those longer daily hours preserve instructional time. But schools in America have evolved into something far more complex—they are simultaneously centers of learning, providers of childcare, distributors of meals, and often the most stable institutions in children's lives. This multifaceted role means that seemingly practical scheduling changes carry profound implications for equity and opportunity. While the four-day school week offers legitimate benefits for teacher retention and operational efficiency, implementing it successfully requires honest acknowledgment that it shifts significant burdens onto families, and therefore demands compensatory community investments that many districts may be unwilling or unable to make.

Perspective One champions the four-day week as overdue modernization, emphasizing benefits for teacher wellbeing and student mental health. These arguments deserve serious consideration. Teacher burnout is genuinely driving talented educators from the profession, and the traditional school calendar—designed for an agricultural society that no longer exists—may indeed be ripe for reimagining. The perspective correctly identifies that longer weekends could allow for recuperation and pursuit of enriching activities. However, this view reveals an optimistic assumption about how that extra day off will be used. For students whose parents can afford summer camps, music lessons, or educational travel, a three-day weekend opens doors to valuable experiences. But for students whose parents work multiple jobs or lack transportation, that Friday might mean sitting home alone watching television or, worse, being unsupervised in unsafe conditions. The perspective's emphasis on "family bonding" and "independent

projects" inadvertently exposes its blind spot: it assumes families have the resources—time, money, stability—to make that day enriching rather than merely empty.

Perspective Two provides a necessary corrective by centering equity concerns. By highlighting how the four-day week affects low-income families, working parents, and vulnerable children, this perspective forces us to acknowledge that schools provide far more than instruction. Free and reduced-price meals aren't just conveniences; for many students, they're the most reliable nutrition they receive. Adult supervision at school isn't just childcare; it's safety. The perspective's emphasis on longer school days exceeding young children's attention spans is particularly compelling—there's substantial developmental research showing that seven-year-olds cannot maintain focus for eight-hour days the way teenagers might. However, Perspective Two may be too quick to dismiss the possibility of thoughtful implementation. Its categorical rejection doesn't leave room for communities that might successfully address these concerns through coordinated social services, subsidized childcare programs, or community partnerships. By framing the issue as an either-or choice, this perspective may foreclose solutions that could genuinely serve both teacher retention and student welfare.

Perspective Three's context-dependent approach offers the most intellectually honest framing: whether a four-day week works depends entirely on local circumstances and implementation quality. This perspective wisely resists the temptation to declare the model universally good or bad, instead asking the right questions about community resources, demographic needs, and structural details. A rural district with sixty students, severe teacher shortages, and families accustomed to self-reliance might implement this schedule successfully, while an urban district serving predominantly low-income families working hourly service jobs might create disaster with the same change. The perspective's call for careful assessment of local context is prudent. However, this nuanced stance risks becoming an evasion—"it depends" can be intellectually satisfying while offering little guidance for actual decision-making. Moreover, even in contexts where four-day weeks seem appropriate, Perspective Three doesn't adequately address whether districts have the political will and financial resources to do the necessary support work.

My own perspective builds on Perspective Three's contextual approach while incorporating Perspective Two's equity concerns: the four-day school week should only be implemented in districts willing to make substantial concurrent investments in community support systems, and even then, only where geographic and demographic factors make success plausible. This means a district considering the change must simultaneously establish free Friday programming for students who need it—not merely childcare, but genuinely enriching activities led by qualified staff. It means providing meals for students who depend on school nutrition programs. It means coordinating with employers to help working parents adjust schedules or find affordable childcare. These investments require funding, often substantial funding, which undermines one of the model's primary appeals: cost savings. If a district is attracted to the four-day week mainly to reduce expenses, it should not proceed, because cutting costs while shifting burdens to already-struggling families is indefensible. However, a district motivated primarily by teacher retention and wellbeing, and willing to invest in comprehensive support, might implement the model ethically.

Consider what happened in rural Colorado, where numerous small districts adopted four-day weeks. Some reported success: teacher applications increased, and families appreciated the flexibility. But research also found that student achievement gains were minimal or nonexistent, and in some districts, juvenile crime increased on Fridays as unsupervised teenagers got into trouble. The mixed results validate Perspective Three's context-dependent view while supporting Perspective Two's equity concerns. The districts that

succeeded were typically those with strong community ties, available parents, and existing infrastructure for youth activities—advantages not every community possesses.

Ultimately, the four-day school week debate reveals a deeper tension about educational responsibility in America. We expect schools to maximize academic achievement, serve as social safety nets, accommodate parents' work schedules, and operate with limited resources—a set of demands that may be fundamentally incompatible. Rather than viewing schedule changes as purely logistical decisions, we should recognize them as statements about values and priorities. A community that implements a four-day week while ignoring its impact on vulnerable families is essentially declaring that efficiency matters more than equity. But a community that implements the change alongside robust support systems might genuinely improve both teacher and student wellbeing. The schedule itself is morally neutral; what matters is whether we're willing to invest in making it work for everyone, not just those already privileged with resources and flexibility.

SCORE ANALYSIS FOR THIS ESSAY

Ideas and Analysis: 12/12

Strengths demonstrated:

- Generates a sophisticated, nuanced argument that examines multiple dimensions of the issue
- Opens with a thought-provoking reframing: "What is school actually for?"
- Critically engages with all three perspectives, identifying both strengths and blind spots
- Examines underlying assumptions (e.g., Perspective One assumes families have resources to make the extra day enriching)
- Places the issue in broader context about educational purpose and social responsibility
- Recognizes tensions and complexities rather than oversimplifying
- Final paragraph elevates the discussion to explore what the debate reveals about values

Development and Support: 12/12

Strengths demonstrated:

- Develops ideas thoroughly with integrated reasoning and examples
- Uses the Colorado rural districts example to provide concrete evidence
- Explains the significance of examples (e.g., showing how mixed results validate certain perspectives)
- Anticipates and addresses counterarguments
- Each paragraph builds the argument systematically
- Specific details strengthen claims (e.g., "seven-year-olds cannot maintain focus for eight-hour days")
- Support is well-integrated rather than listed

Organization: 12/12

Strengths demonstrated:

- Clear, logical structure that enhances the argument
- Strong introduction that establishes stakes and presents a clear thesis
- Each body paragraph has a clear focus and purpose
- Effective transitions between ideas ("However, this view reveals...," "Perspective Two provides a necessary corrective...")
- Paragraphs build on each other logically
- Conclusion synthesizes insights rather than merely restating
- Unity within paragraphs—each stays focused on its main point

Language Use and Conventions: 12/12

Strengths demonstrated:

- Sophisticated vocabulary used precisely ("compensatory community investments," "categorical rejection," "inadvertently exposes")
- Varied, complex sentence structures
- Strong command of punctuation, including effective use of dashes and colons
- Maintains formal academic tone throughout
- Virtually no errors in grammar or mechanics
- Word choice enhances meaning (e.g., "foreclose solutions," "evasion")
- Sentences flow naturally and maintain reader engagement

OVERALL SCORE: 12/12

This essay demonstrates the characteristics of the highest scoring range:

1. **Engages deeply with the complexity** of the issue rather than treating it simplistically
2. **Analyzes all three perspectives** thoughtfully, identifying strengths and limitations
3. **Develops a sophisticated personal perspective** that incorporates insights from multiple viewpoints
4. **Uses specific examples** (Colorado districts) effectively
5. **Maintains strong organization** with clear progression of ideas
6. **Demonstrates sophisticated writing** with varied syntax and precise language
7. **Shows intellectual maturity** by recognizing that the debate reveals deeper questions about educational values

What makes this essay exemplary:

- The opening paragraph immediately establishes intellectual engagement
- Each perspective receives substantive analysis, not just summary

- The writer's own position is clear but nuanced
- The essay addresses counterarguments
- The conclusion offers genuine insight rather than repetition
- The writing is clear, sophisticated, and engaging throughout

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WHAT STUDENTS CAN LEARN FROM THIS ESSAY

Effective techniques to emulate:

1. **Start with a compelling frame**: "What is school actually for?" immediately signals sophisticated thinking
2. **Acknowledge complexity**: Phrases like "however," "while," and "yet" show you recognize multiple dimensions
3. **Use specific examples**: The Colorado districts example grounds abstract discussion in reality
4. **Analyze, don't just summarize**: Don't just say what each perspective claims—explain its assumptions and implications
5. **Take a clear stance**: The thesis is specific and arguable, not vague
6. **Connect paragraphs**: Each paragraph builds on the previous one
7. **Elevate in the conclusion**: End with broader implications rather than just restating your introduction
8. **Write with confidence**: Sophisticated vocabulary and complex sentences (when clear) demonstrate strong writing skills

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ADDITIONAL NOTES

Time management: This essay is approximately 900 words, which is achievable in 40 minutes for a well-prepared student who plans efficiently (5-7 minutes planning, 28-30 minutes writing, 3-5 minutes reviewing).

Realistic expectations: Not every student will write at this level, and that's okay. Essays scoring 8-10 (demonstrating good to strong skills) still show admirable achievement. This sample represents the highest level to give students a model to work toward.

Key takeaway: High-scoring essays don't just answer the question—they demonstrate genuine intellectual engagement with complex ideas. They show the reader that the writer is thinking critically, not just completing an assignment.