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ENGLISH TEST

45 Minutes—75 Questions

DIRECTIONS: In the passages that follow, some words and phrases are underlined and numbered. In the answer column, you will find alternatives for the words and phrases that are underlined. Choose the alternative that you think is best, and fill in the corresponding bubble on your answer sheet. If you think that the original version is best, choose "NO CHANGE," which will always be either answer choice A or F. You will also find questions about a particular section of the passage, or about the entire passage. These questions will be identified by either an underlined portion or by a number in a box. Look for the answer that clearly expresses the idea, is consistent with the style and tone of the passage, and makes the correct use of standard written English. Read the passage through once before answering the questions. For some questions, you should read beyond the indicated portion before you answer.

PASSAGE I

Lil' Lou

The old cedar chest hadn't been opened nor its contents examined in years, maybe even a decade or more. My grandmother had asked me to help her sort through some of her old belongings, giving me a rare opportunity to hear some of her stories from long ago and, consequently, revealing my own personal history. Grandma had been widowed long ago, and I knew very little about my grandfather other than what a wonderful man he had been. This was the recurring description of my grandfather whenever his name was mentioned[1] to anyone who had known him: the person would slowly move his lowered head from side to side and softly mutter, "A wonderful man … he was a wonderful man."

[1] That afternoon, I found myself standing in front of the chest with my grandmother by my side. [2] Grandma had been putting off opening the chest, which was sure[2] to be an emotional experience. [3] She knew better than anyone else that[2] vast memories

1. **A.** NO CHANGE
B. grandfather whenever his name should have been mentioned
C. grandfather whenever his name being mentioned
D. grandfather. Whenever his name was mentioned

2. Given that all of the choices are true, which one provides a detail that best leads into the description that follows in this paragraph?
F. NO CHANGE
G. which had been purchased from an old catalog long ago.
H. which was made of cedar and redwood.
J. which was kept locked to protect the contents from mice.

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were stored in this treasure, trove, and the[3] mere opening of its lid would stir up a flood of happiness and grief, spinning and growing like a hurricane out of control. [4] Truth be told, the kind of help[4] my grandmother needed when opening the chest was more likely emotional than physical. [5] I was ready and eager, and with my help as a buffer, Grandma was ready, too. [5]

3. **A.** NO CHANGE
B. treasure trove, and, the
C. treasure trove, and the
D. treasure trove and, the

4. Which of the following alternatives to the underlined portion would NOT be acceptable?
F. If the truth were told, the kind of help
G. Truth be told, the sort of help
H. Truth be told, the kind of type of help
J. To tell the truth, the kind of help

5. Which of the following sentences in this paragraph is LEAST relevant to the purpose of describing the narrator's actions and, therefore, could be deleted?
A. Sentence 1
B. Sentence 2
C. Sentence 3
D. Sentence 4

The moment the air hit the wooden box interior[6], a strong waft of cedar scent made its way to our noses.

6. **F.** NO CHANGE
G. wooden box's interior
H. wooden boxes interior
J. wooden boxes' interior

My grandmother having explained[7] that the source of this forest-like aroma made it possible for the artifacts inside the chest to remain intact, with no moth holes or tattered fabric. Sure enough, as my grandmother lifted the first item out of its tomb, I could see that the garment was very old, but at the same time it appeared very new. It was my grandfather's wool flying jacket from World War II. Grandma hugged it to her chest for several moments before holding it out in front of her, as if she could see my grandfather wearing it. I simply sat and watched, waiting for her to tell me about it and about him.

7. **A.** NO CHANGE
B. explains
C. explained
D. was explaining

Grandpa had been a pilot during the war, flying[8] what was known as a Stinson L-5 Sentinel. Besides, when[9]

8. **F.** NO CHANGE
G. war which was flying
H. war he was flying
J. war flying

9. **A.** NO CHANGE
B. After all, when
C. Instead, when
D. When

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Grandpa first decided to fly, his dream had been to man bomber planes; he desperately wanted to be on the frontline of the air defense. After taking the appropriate instruction, he was removed from the bombing corps because of his imperfect eyesight, and his dream was shattered. For Grandma, this was her dream come true; Grandpa's chances of returning home safely to his new wife, and, daughter (10) were much higher with their (11) new designation as a liaison pilot. [12]

As my grandmother told my grandfather's story, she mindlessly examined his jacket, putting her hand down one sleeve, turning to see its back, and sticking her fingers into each lined pocket. Tucked into the breast pocket of my grandfather's heavy flight jacket was a small black and white photo. It was my grandfather standing in front of his large plane, (13) his "Lil' Lou," which was painted on the plane's nose, along with a happy little pink rabbit with a bright orange carrot. I knew instantly that the L-5's nickname was a loving reference to my grandmother, whose (14) given name was Louise.

10. **F.** NO CHANGE
G. new wife and daughter
H. new wife, and daughter
J. new wife and daughter,

11. **A.** NO CHANGE
B. it's
C. its
D. his

12. Which of the following true statements, if added at the beginning of this paragraph would most effectively introduce readers to the information presented in the paragraph?
F. Good eyesight has always been an essential quality in a bomber pilot.
G. Men have always had their dreams of glory, and my grandfather was no different.
H. My grandfather joined the army soon after my mother was born.
J. My great-grandparents were pacifists, but that hadn't stopped my grandfather from enlisting.

13. Given that all the choices are true, which one provides information that is most relevant at this point in the essay?
A. NO CHANGE
B. pride and joy
C. bomber
D. war plane

14. **F.** NO CHANGE
G. who's
H. her
J. by her

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Question 15 asks about the preceding passage as a whole.

15. Suppose the writer's goal had been to write a brief essay on the historical significance of air support in World War II. Would this essay successfully accomplish this goal?

A. Yes, because it describes the different types of air support used by the military in World War II.
B. Yes, because it explains the importance of liaison pilots to the overall military effort.
C. No, because it focuses instead on the personal significance of an individual World War II pilot.
D. No, because it fails to describe the relationship between the narrator's grandparents.

PASSAGE II

The Fruit of the Vine

It is difficult to imagine a human diet without tomatoes in some form, whether a fresh tomato right off the vine or in a spaghetti sauce over pasta. Having become a staple of the American kitchen, tomatoes are[16] even when out of season and of inferior quality.

During the growing season, tomatoes of every variety abound in grocery stores, roadside stands, and even on tables in front of peoples' homes.[17] With tomatoes so readily available during the growing season, it's easy to run out of things to do with them. [18] Luckily, there are

16. **F.** NO CHANGE
G. Tomatoes have become a staple of the American kitchen,
H. With tomatoes becoming a staple of the American kitchen,
J. While tomatoes have become a staple of the American kitchen,

17. **A.** NO CHANGE
B. grocery stores roadside stands and even on tables in front of peoples' homes.
C. grocery stores, roadside stands and, even on tables in front of peoples' homes.
D. grocery stores, roadside stands and, even, on tables in front of peoples' homes.

18. If the writer were to delete the phrase "With tomatoes so readily available during the growing season" from the preceding sentence, the paragraph would primarily lose:

F. a detail that more fully explains why a reader would need more tomato recipes.
G. information that explains why the writer likes tomatoes.
H. a comparison between tomatoes and other summer produce.
J. nothing at all, since the details about the availability of tomatoes is irrelevant to the paragraph.

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some plenty ways to use and enjoy this surplus of fresh
19

tomatoes. While all are delicious, recipes for using
20
fresh tomatoes range from a basic tomato salad (sliced
20
tomatoes with oil and vinegar) to complicated sauces requiring hours to simmer and stew. Many cooks prefer to peel and deseed the tomatoes, while using them in a
21

cooking recipe. Peeling can be easily accomplished by first
22
scoring one end of the tomato with a sharp knife, making a small crosshatch, and then dropping the fruit into boiling water for approximately 30 seconds. Whomever chooses
23
this method should be careful not to splash the hot water when placing the tomato into the pot. After the time is up, the cook can use tongs to remove the tomato from the boiling water and set it aside. Waiting until it is
24
cool enough to handle. The skin can then be easily
24
removed with a sharp kitchen knife, and the tomato's seeds can be collected in a strainer. This is an important step, as the tomato may still be very hot.
25

Even green tomatoes harvested before the first frost can be ripened indoors or used in a green tomato recipe, green
26

19. **A.** NO CHANGE
B. plenty of
C. plenty with
D. OMIT the underlined portion.

20. Given that all the choices are true, which one provides the best transition by providing specific information?
F. NO CHANGE
G. Especially, recipes for using fresh tomatoes
H. Even though recipes for using fresh tomatoes
J. Some recipes for using fresh tomatoes

21. **A.** NO CHANGE
B. tomatoes and
C. tomatoes, and
D. tomatoes before

22. **F.** NO CHANGE
G. easy; accomplish
H. easily accomplishing
J. easily accomplish

23. **A.** NO CHANGE
B. Whoever chooses
C. Whomever chose
D. Whoever chose

24. **F.** NO CHANGE
G. aside. Until it is cooling enough to handle.
H. aside until it is cool enough to handle.
J. aside. Just until it is cool enough to handle.

25. Given that all the choices are true, which one concludes this paragraph with a point most consistent with other points made in this paragraph?
A. NO CHANGE
B. as the tomato seeds can be used to grow new plants.
C. as tomato seeds can be very slippery when they are wet.
D. as tomato seeds can sometimes add a bitter taste to a tomato dish.

26. **F.** NO CHANGE
G. recipe green
H. recipe. Green
J. recipe, while green

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tomatoes placed on a kitchen shelf will ripen nicely in just a short amount of time. Once a tomato is a bright red color, it[27] can be used for cooking or stored for later use. A fresh tomato won't last long, even in the refrigerator, so it's best to decide early on which tomatoes should become salsa or sauce and which should be served raw in a salad or sandwich. [28]

There is truly only one way to eat a fresh tomato and experience its ultimate taste. Go into a garden, pluck a tomato off the vine, brush off any dirt, and then eat it like an apple. The Italians may have rejected the tomato when it was first introduced to their diets, believing it to be poisonous, but it certainly didn't take one[29] long to incorporate this delicious fruit into nearly every homemade dish. Biting into a freshly picked, red tomato irrefutably explains why.

27. **A.** NO CHANGE
B. a bright, red, color, it
C. a bright red color it
D. a bright, red, color it

28. The writer is considering revising the phrase "which tomatoes should become salsa or sauce and which should be served raw in a salad or sandwich" in the preceding sentence to read:

> which tomatoes should be prepared or cooked in a salsa or sauce and which should be left in their natural raw state, but sliced in a salad or sandwich.

F. Make the revision, because it adds details that clarify the point being made in this sentence.
G. Make the revision, because it emphasizes how important it is to choose fresh vegetables.
H. Keep the phrase as it is, because it's specific, whereas the proposed revision is ambiguous.
J. Keep the phrase as it is, because it's shorter and more concise than the proposed revision.

29. **A.** NO CHANGE
B. it
C. anyone
D. them

Question 30 asks about the preceding passage as a whole.

30. Suppose the writer's goal had been to describe the many ways tomatoes can be used in modern cuisine. Does this essay successfully accomplish this goal?
F. Yes, because it describes many different tomato dishes and encourages the reader to try them.
G. Yes, because it makes a distinction between ancient and modern attitudes towards the tomato.
H. No, because it discusses tomatoes in a more general sense and includes other pieces of information.
J. No, because it only discusses cooking techniques and does not mention specific recipes.

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PASSAGE III

The following paragraphs may or may not be in the most logical order. Each paragraph is numbered in brackets, and Question 45 will ask you to choose where Paragraph 3 should most logically be placed.

Modern Dentistry

[1]

Only two or three generations ago, a painful toothache often resulted in an equally painful extraction, permanently leaving an empty (31) hole where an incisor or molar had once been. Aging often meant eventually losing each tooth, one by one, as decay or breakage took its toll. Many people ended up in the same position as when their lives began, gumming (32) their food instead of chewing it.

[2]

It (33) wasn't until the early 1960s that dentistry began looking the way it does today, with its sterile tools, modern equipment, and new techniques.

Disposable needles that can be tossed in the trash, (34) first introduced during World War II, and a better understanding of bacteria and the spread of diseases provided for a much more sterile environment than before. Tools that were not disposable were sterilized with the use of an autoclave, which became a required piece of equipment in any dentist's office. [35] The autoclave, or sterilizer, first invented by Charles Chamberland in 1879, is a pressurized container that heats the water inside it above the boiling point, effectively sterilizing any steel instruments inside by

31. **A.** NO CHANGE
B. a gaping
C. somewhat of a
D. OMIT the underlined portion.

32. **F.** NO CHANGE
G. began; gumming
H. began. Gumming
J. began gumming

33. **A.** NO CHANGE
B. However, it
C. For example, it
D. In the meantime, it

34. **F.** NO CHANGE
G. Disposable needles designed to be thrown away
H. Disposable needles that can be tossed out
J. Disposable needles

35. The writer is considering deleting the phrase "which became a required piece of equipment in any dentist's office" from the preceding sentence (ending the sentence with *autoclave*). Should the phrase be kept or deleted?
A. Kept, because it emphasizes the universal importance of the device in modern dentistry.
B. Kept, because it clarifies the term *autoclave* and contributes to the logic of the paragraph.
C. Deleted, because the paragraph has already stated that modern dentist offices had become more sterile.
D. Deleted, because it draws attention away from teeth and places it on equipment.

GO ON TO THE NEXT PAGE.

using the heat to kill the viruses and bacteria on the instruments. [36] Today, most dentists use as many disposable tools and materials as possible in an effort to squelch the spread of any viruses or bacteria. Most dental workers will even wear facemasks over their mouths and

use plastic gloves as they worked [37] on a patient.

[3]

In many ways, today's dentists have an easier task before them as the profession has evolved and materials and procedures have improved.

On the other hand the constant changes [38] being made in the dental profession require a dentist to both learn about and incorporate the changes into his or her own practice.

Looking back [39] at the last 50 years of this evolution demonstrates that making these changes

can be a daunting challenge. [40]

[4]

High speed drills have replaced the foot pump operation of older drills, and more effective water coolers and suction tools have replaced the cruder prototypes used in the early 1900s. The cuspidor has gone mostly by the wayside, replaced by a suction device that the dentist's assistant uses to remove rinse-water or tooth fragments from the patient's mouth. X-ray equipment has also greatly improved over the past several decades; X-ray [41]

36. The writer is considering deleting the phrase "by using the heat to kill the viruses and bacteria on the instruments" from the preceding sentence (and placing a period after the word *inside*). Should the phrase be kept or deleted?
- **F.** Kept, because it clarifies the claim made in first part of the sentence.
- **G.** Kept, because it strengthens the paragraph's focus on viruses and bacteria.
- **H.** Deleted, because the essay is mainly about dentistry, not spreading diseases.
- **J.** Deleted, because the phrase fails to add new or useful information.

37. **A.** NO CHANGE
- **B.** work
- **C.** have worked
- **D.** working

38. **F.** NO CHANGE
- **G.** On the other hand; the constant changes
- **H.** On the other hand, the constant changes
- **J.** On the other hand, the constant changes,

39. **A.** NO CHANGE
- **B.** In looking back
- **C.** While looking back
- **D.** Whereas looking back

40. Given that all the choices are true, which one best clarifies the distinction between today's dentists and the ones of 50 years ago?
- **F.** NO CHANGE
- **G.** pushes today's dentists to the limits of their training.
- **H.** is difficult.
- **J.** involves all aspects of dentistry.

41. **A.** NO CHANGE
- **B.** decades, X-ray
- **C.** decades X-ray
- **D.** decades, and making X-ray

machines are now much safer and easier to operate, as well as more compact in size. The dental chair has also undergone radical changes over the years, because it would allow greater comfort for the patient and easier access for the dentist.

[5]

Dental procedures and techniques likewise improved dramatically during the second half of the twentieth century after 1950. New anesthetic methods add to patient comfort, an essential component in any successful dental procedure. The physician can choose from a variety of numbing options, depending on the patient and the procedure being done. Preserving teeth, rather than simply extracting them when damaged, is the goal of most dentists today. Dental amalgams, silicates, and gold and porcelain crowns have all become easier to work with and are much more durable.

42. **F.** NO CHANGE
G. since it allows for
H. allowing
J. which would be allowing

43. **A.** NO CHANGE
B. century, after 1950.
C. century, after 1950 and later.
D. century.

44. Given that all the choices are true, which one concludes the paragraph with a precise and detailed description that relates to the main topic of the essay?
F. NO CHANGE
G. Sunny smiles and happy patients are finally brightening dentist offices across the country.
H. Over time, even more improvements can be expected.
J. Hardly any patients need dentures anymore.

Question 45 asks about the preceding passage as a whole.

45. For the sake of the logic and coherence of this essay, Paragraph 3 should be placed:
A. where it is now.
B. after Paragraph 1.
C. after Paragraph 4.
D. after Paragraph 5.

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PASSAGE IV

English Art

Our Advanced English teacher Mr. Peale; (46) decided to end the semester with a unique and unexpected challenge. He wanted each of us to find a picture of a famous oil painting that we especially liked and (47) bring it to school. We were certain he was going to have us write something about our pictures, so we all happily shared: (48) our Picassos, Van Goghs, and Cezannes in class the next day. Then the surprise announcement came. We were each to attempt to copy our picture onto a full-sized canvas using real oil paints and brushes. The brushes were not real boar (49) bristles, but Mr. Peale said they would work just as well. (49)

I will never forget how terribly insecure I felt as I began my painting. As I secretly glanced looking at others (50) around me, (50) my anxiety and self-doubt only seemed to grow. It appears (51) to me that my peers were not only brilliant English students but accomplished artists as well! Mr. Peale walked around the classroom and suddenly became an art instructor as he loudly proclaimed (52) to the other students what an excellent job they were doing. I felt quite tentative and barely had a mark on my own canvas. I was way out of my element!

[1] Mr. Peale finally walked over to me and I silently gulped. [2] He said very little about my attempts, which was both a blessing and a curse. (53) [3] His lack of comment kept me from turning beet red, yet his quiet

46. **F.** NO CHANGE
G. teacher Mr. Peale—
H. teacher, Mr. Peale
J. teacher, Mr. Peale,

47. **A.** NO CHANGE
B. painting, that we especially liked, and
C. painting that we especially liked, and
D. painting, that we especially liked, and,

48. **F.** NO CHANGE
G. shared
H. shared,
J. share

49. **A.** NO CHANGE
B. Did I mention this wasn't an art class?
C. I had chosen a French impressionist.
D. DELETE the underlined portion.

50. **F.** NO CHANGE
G. glanced looking at others around me on all sides
H. glanced around me
J. glanced at others surrounding me

51. **A.** NO CHANGE
B. appeared
C. appearing
D. has appeared

52. Which of the following alternatives to the underlined portion would be LEAST acceptable?
F. declared
G. announced
H. affirmed
J. published

53. If the writer were to delete the phrase "which was both a blessing and a curse" from the preceding sentence (ending the sentence with *attempts*), the essay would primarily lose:
A. a relevant description of the writer's attitude towards her English teacher.
B. information about the writer's attitude towards Impressionist art.
C. the suggestion that the writer was feeling ambivalent about her teacher's response to her painting.
D. a fact about the writer's skill as a painter.

demeanor clearly told me that he was unimpressed with my torturous efforts. [4] He continued past me to the next student, which, to me, was an obvious message that I was completely hopeless as an artist. [5] I had been so reluctant to begin my painting, despite my love for the artist's rendering of a beautiful bronze, pink, and yellow sunset and a single leafless tree in the foreground. [6] Something snapped inside me as Mr. Peale announced that we were done for the day, and we would continue this week-long project the tomorrow. [7] I could hardly wait to get back there and work on my masterpiece. [54]

By the end of this odd assignment, I was actually thrilled with that being which I had reproduced. While my painting wasn't as dramatic as many of my classmates', and it didn't look exactly like its original, I did feel I had captured its essence. [56]

54. For the sake of the logic and coherence of this paragraph, Sentence 3 should be placed:
- **F.** where it is now.
- **G.** before Sentence 1.
- **H.** before Sentence 2.
- **J.** after Sentence 5.

55.
- **A.** NO CHANGE
- **B.** the painting of which
- **C.** what
- **D.** that

56. At this point, the writer is considering adding the following true statement:

> It had a certain beauty and serenity about it that the photo had emitted to me from the beginning.

Should the writer make this addition here?

- **F.** Yes, because it provides details about the essence of the painting and explains reasons behind its value to the writer.
- **G.** Yes, because it provides important information about the original artist's style of painting.
- **H.** No, because it does not provide a direct connection between the original artwork and the writer's reproduction.
- **J.** No, because it is already clear from the essay why her reproduction was valuable to the writer.

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The painting is actually hanging on my wall[57] for years afterwards. I had moved past my fears and lack of self-confidence and allowed myself to explore the space of the canvas, the enticing oil colors, and a variety of brush strokes. I actually felt that somewhat[58] inside of me there was an artist.

To this day, I have no idea what Mr. Peale's intention was when he asked his English students to reproduce a famous oil painting. Was he merely trying to fill up the end of the semester by keeping us preoccupied with busywork[59] while he sat at his desk and red-lined the novelettes we had written earlier in the semester? Or was he challenging our self-importance as Advanced English students, trying to knock us down a peg or two? I do know what I will still think[60] about what that assignment taught me about myself: the absolute beauty of surrendering to the possibilities in life, and that for a small moment, I too was an artist.

57. **A.** NO CHANGE
B. The painting actually hung on my wall
C. I was actually hanging by the painting
D. The painting was actually hung by me on my wall

58. **F.** NO CHANGE
G. somewhere
H. even though
J. throughout

59. **A.** NO CHANGE
B. keeping us busy and preoccupied with unimportant tasks
C. keeping us preoccupied
D. maintaining our preoccupation

60. **F.** NO CHANGE
G. that I am still full of thought
H. that which I still think
J. that I still think

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PASSAGE V

Coffee in the Shade

Who would have thought that there was any connection between a cup of coffee and a bird, butterfly, or even a bat? Such seems to be the case, however, as [61] methods for cultivating coffee plants have gradually changed over the past 30 to 40 years. Coffee plants were first discovered growing naturally, in Africa; [62] hundreds of years ago. The plants grew under a wide canopy of forests, which protected the coffee plants' tender leaves from the burning sun. As coffee was introduced to other country, [63] growers would naturally attempt to simulate the plants' preferred natural habitat. Nevertheless, [64] coffee plantations all over the world could be found growing successfully in the shade of tall trees. These trees provided more than shade for coffee plants; so they [65] were also home and protection for many species of birds, reptiles, insects, and other plants.

Over the past several decades, growers were developing [66] a new kind of coffee plant, one which is not only tolerant of the sun but thrives [67] in open sunlight. Sun-grown coffee produced as much as three times the yield of shade-grown coffee in the same amount with [68] time and space.

Consequently, [69] the high demand for coffee throughout the world makes the sun-grown method of coffee production appear to be the best method.

61. **A.** NO CHANGE
B. however; as
C. however. As
D. however as,

62. **F.** NO CHANGE
G. naturally in Africa
H. naturally; in Africa,
J. naturally: in Africa

63. **A.** NO CHANGE
B. other countries
C. other countries'
D. other countries,

64. **F.** NO CHANGE
G. Despite this,
H. As a result,
J. Even more so,

65. **A.** NO CHANGE
B. coffee plants; they
C. coffee plants, they
D. coffee plants that they

66. **F.** NO CHANGE
G. growers, by developing
H. growers developed
J. by growers was developed

67. Which of the following alternatives to the underlined portion would NOT be acceptable?
A. tolerates the sun and even thrives
B. is able to tolerate the sun and thrive
C. is not only tolerant of the sun however thrives
D. does not merely tolerate the sun but thrives

68. **F.** NO CHANGE
G. amounting to
H. amount for
J. amount of

69. **A.** NO CHANGE
B. Since
C. However,
D. Furthermore,

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[1] It has been discovered, however, that there are some unanticipated consequences to using this newer method of growing coffee. [2] First, there might be a chance of rain, (70) often washing away the soil's nutrients and minerals.

[3] Ornithologists who are discovering (71) alarming decreases in some species of songbirds that migrate to the northern United States. [4] This necessitates an increased use of fertilizers and additives, which is labor-intensive and liable to create health risks. [5] Second, as (72) forests are taken down to make way for sun-grown coffee plants, native and migratory birds, as well as many other fauna and flora, (73) no longer have a home. [6] This is threatening many species, and the effect is now being examined and recorded.

[7] Finally, more pesticides and insecticides are used in the sun-grown method, all of which take their toll on both the environment and the long-term health of the coffee plants themselves. [74]

Today, shade-grown coffee is more difficult to find and thus more costly. Sitting out on the patio with a morning cup of coffee may soon be a much quieter experience in some locations due to the decimation of certain local songbird species. As more people recognize (75) the connection between coffee production and the environment, perhaps they will be willing to pay the higher prices, encouraging growers to return to the more natural method of producing this world-wide staple.

70. Given that all the choices are true, which one would add the most effective visual detail to the description provided in the second part of this sentence?
- **F.** NO CHANGE
- **G.** the lack of tree cover leaves the land open to pounding rainfall,
- **H.** the land is vulnerable to rain,
- **J.** rain often falls,

71. **A.** NO CHANGE
- **B.** who discovered
- **C.** are discovering
- **D.** discovered

72. Which of the following alternatives to the underlined portion would NOT be acceptable?
- **F.** when
- **G.** since
- **H.** because
- **J.** therefore

73. **A.** NO CHANGE
- **B.** birds as well as many other fauna and flora
- **C.** birds, as well as many other fauna, and flora
- **D.** birds, as well as many other fauna, and flora,

74. For the sake of the logic and coherence of this paragraph, Sentence 3 should be placed:
- **F.** where it is now.
- **G.** before Sentence 2.
- **H.** before Sentence 5.
- **J.** before Sentence 7.

75. **A.** NO CHANGE
- **B.** As more and more people together recognize
- **C.** As more people as one group recognize
- **D.** As lots more people who think recognize

END OF THE ENGLISH TEST.
STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

2 △ △ △ △ △ △ △ △ 2

MATHEMATICS TEST

60 Minutes—60 Questions

DIRECTIONS: Solve each of the problems in the time allowed, then fill in the corresponding bubble on your answer sheet. Do not spend too much time on any one problem; skip the more difficult problems and go back to them later. You may use a calculator on this test.

For this test you should assume that figures are NOT necessarily drawn to scale, that all geometric figures lie in a plane, and that the word line is used to indicate a straight line.

DO YOUR FIGURING HERE.

1. One pound is equivalent to 16 ounces. If a book weighs 1.5 pounds, how many ounces, to the nearest tenth, does the book weigh?
A. 10.7
B. 17.5
C. 24.0
D. 61.5
E. 165.0

2. Which of the following expressions is equivalent to $(3x + 4)(x - 5)$?
F. $3x^2 + 9x - 9$
G. $3x^2 + 9x + 20$
H. $3x^2 - 19x - 9$
J. $3x^2 - 11x - 20$
K. $3x^2 + 20x - 20$

3. Let a function of 2 variables be defined by $f(a, b) = ab - (a - b)$. What is the value of $f(8,9)$?
A. 89
B. 73
C. 71
D. 34
E. 0

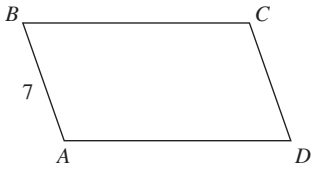
4. What is 1/5 of 16% of \$24,000?
F. \$160
G. \$768
H. \$3,840
J. \$4,032
K. \$7,500

5. If $5x + 5 = 25 + 3x$, then $x =$?
A. 2.5
B. 10
C. 20
D. 50
E. 62.5

2 △ △ △ △ △ △ △ △ 2

DO YOUR FIGURING HERE.

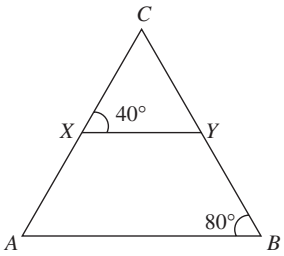
6. In parallelogram $ABCD$ shown below, AB is 7 inches long. If the parallelogram's perimeter is 46 inches, how many inches long is AD?



F. $6\frac{1}{2}$
G. 16
H. 28
J. 39
K. 49

7. $|14| \times |-2| =$?
A. -28
B. -16
C. -12
D. 16
E. 28

8. In the figure below, X and Y lie on the sides of ΔABC, and $\overline{XY}$ is parallel to $\overline{AB}$. What is the measure of $\angle C$?



F. 120°
G. 90°
H. 80°
J. 60°
K. 40°

9. If $x = -3$ and $y = 2$, then $x^3y + xy^3 =$?
A. 78
B. 30
C. -6
D. -30
E. -78

2 △ △ △ △ △ △ △ △ 2

10. Two professors were hired to begin work at the same time. Professor A's contract called for a starting salary of $50,000 with an increase of $1,500 after each year of employment. Professor B's contract called for a starting salary of $42,000 with an increase of $2,800 after each year of employment. If y represents the number of full years of employment (that is, the number of yearly increases each professor has received), which of the following equations could be solved to determine the number of years until B's yearly salary equals A's yearly salary?

F. $50,000 + 1,500y = 42,000 + 2,800y$
G. $50,000 + 2,800y = 42,000 + 1,500y$
H. $1,500y + 2,800y = y$
J. $1,500y + 2,800y = 42,000$
K. $1,500y + 2,800y = 50,000$

11. If $W = XYZ$, then which of the following is an expression for Z in terms of W, X, and Y?

A. $\frac{XY}{W}$
B. $\frac{W}{XY}$
C. WXY
D. $W - XY$
E. $W + XY$

12. Two whole numbers have a greatest common factor of 8 and a least common multiple of 48. Which of the following pairs of whole numbers will satisfy the given conditions?

F. 4 and 9
G. 5 and 10
H. 10 and 16
J. 14 and 20
K. 16 and 24

13. A rope 55 feet long is cut into two pieces. If one piece is 23 feet longer than the other, what is the length, in feet, of the shorter piece?

A. 2
B. 16
C. 23
D. 32
E. 51

DO YOUR FIGURING HERE.

2 △ △ △ △ △ △ △ △ 2

14. If $(x+r)^2 = x^2 + 22x + r^2$ for all real numbers x, then $r =$?
F. 11
G. 22
H. 44
J. 88
K. 176

15. Jenny ran $3\ \frac{1}{3}$ miles on Saturday and $2\ \frac{4}{5}$ miles on Sunday. The total distance, in miles, Jenny ran during those 2 days is within which of the following ranges?
A. At least $6\ \frac{1}{2}$ and less than $6\ \frac{2}{3}$
B. At least $6\ \frac{1}{3}$ and less than $6\ \frac{1}{2}$
C. At least 6 and less than $6\ \frac{1}{3}$
D. At least $5\ \frac{2}{3}$ and less than 6
E. At least $5\ \frac{1}{2}$ and less than $5\ \frac{2}{3}$

16. A car leaves a parking lot and travels directly north for 6 miles. It then turns and travels 8 miles east. How many miles is the car from the parking lot?
F. 6
G. 8
H. 10
J. 14
K. 68

17. In the standard (x,y) coordinate plane, how many times does the graph of $(x+1)(x-2)(x+3)(x+4)$ intersect the x-axis?
A. 1
B. 4
C. 6
D. 10
E. 24

18. Marcia's horse's rectangular corral is 50 feet wide by 125 feet long. Marcia wants to increase the area by 1,850 square feet by increasing the width and length by the same amount. What will be the new dimensions (width by length), in feet?
F. 55 by 130
G. 60 by 135
H. 65 by 135
J. 65 by 140
K. 70 by 145

19. The lengths of the sides of a triangle are 3 consecutive even integers. If the perimeter of the triangle is 48 inches, what is the length, in inches, of the longest side?
A. 12
B. 14
C. 16
D. 18
E. 24

DO YOUR FIGURING HERE.

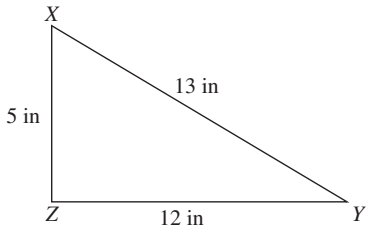
2 △ △ △ △ △ △ △ △ 2

DO YOUR FIGURING HERE.

20. In the standard (x,y) coordinate plane, what is the slope of the line with equation $4y - 6x = 8$?

F. $-\frac{3}{2}$
G. -6
H. $\frac{3}{2}$
J. 3
K. 6

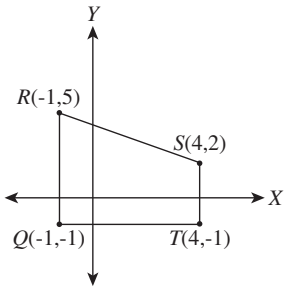
21. In the right triangle shown below, which of the following statements is true about $\angle X$?



A. $\cos X = \frac{13}{5}$
B. $\sin X = \frac{12}{13}$
C. $\tan X = \frac{5}{12}$
D. $\cos X = \frac{12}{5}$
E. $\sin X = \frac{13}{12}$

Use the following information to answer Questions 22–24.

Quadrilateral $QRST$ is shown below in the standard (x,y) coordinate plane. For this quadrilateral, $QT = 5$, $RS = \sqrt{34}$, $ST = 3$, and $RQ = 6$, all in coordinate units.



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22. What is the length of QS in coordinate units?
F. $\sqrt{34}$
G. $\sqrt{10}$
H. $\sqrt{8}$
J. 8
K. 4

23. Which of the following are the coordinates of the image of R under a 90° counterclockwise rotation about the origin?
A. (5,−1)
B. (1,5)
C. (1,−5)
D. (−1,−5)
E. (−5,−1)

24. Which of the following is closest to the perimeter of quadrilateral $QRST$, in coordinate units?
F. 26.0
G. 22.5
H. 19.8
J. 15.0
K. 14.0

---

25. If 5 times a number x is subtracted from 15, the result is negative. Which of the following gives the possible value(s) for x?
A. All $x < 3$
B. All $x > 3$
C. 10 only
D. 3 only
E. 0 only

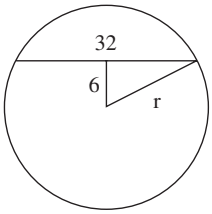
26. The temperature, t, in degrees Fahrenheit, in a certain city on a certain spring day satisfies the inequality $|t - 34| \leq 40$. Which of the following temperatures, in degrees Fahrenheit, is NOT in this range?
F. 74
G. 16
H. 0
J. −6
K. −8

27. What is the slope-intercept form of $10x - y - 8 = 0$?
A. $y = -2x$
B. $y = -10x - 8$
C. $y = -10x + 8$
D. $y = 10x - 8$
E. $y = 10x + 8$

DO YOUR FIGURING HERE.

2 △ △ △ △ △ △ △ △ 2

28. A chord 32 centimeters long is 6 centimeters from the center of a circle, as shown below. What is the radius of the circle, to the nearest tenth of a centimeter?



F. 5.3
G. 13.9
H. 17.1
J. 26.0
K. 38.0

29. What is the least common multiple of 3, $4a$, $5b$, and $6ab$?
A. $15ab$
B. $60ab$
C. $60a^2b$
D. $120ab$
E. $120a^2b$

30. What is the y-coordinate of the point in the standard (x,y) coordinate plane at which the 2 lines $y = 3x + 4$ and $y = 2x + 6$ intersect?
F. 1
G. 2
H. 4
J. 6
K. 10

31. For $x^2 \neq 169$, $\dfrac{(x-13)^2}{x^2-169} =$?
A. $\dfrac{1}{13}$
B. $-\dfrac{1}{13}$
C. $\dfrac{1}{(x+13)}$
D. $\dfrac{1}{(x-13)}$
E. $\dfrac{(x-13)}{(x+13)}$

32. If $n = m + 2$, then $(m-n)^4 =$?
F. 16
G. 8
H. 1
J. -8
K. -16

DO YOUR FIGURING HERE.

2 △ △ △ △ △ △ △ △ 2

33. The larger of two numbers exceeds twice the smaller number by 9. The sum of twice the larger and 5 times the smaller number is 74. If a is the smaller number, which equation below determines the correct value of a?
A. $5(2a + 9) + 2a = 74$
B. $5(2a - 9) + 2a = 74$
C. $(4a + 9) + 5a = 74$
D. $2(2a + 9) + 5a = 74$
E. $2(2a - 9) + 5a = 74$

34. When $x/y = 4$, $x^2 - 12y^2 =$?
F. 0
G. $4y^2$
H. $-4y^2$
J. $-8y^2$
K. $4y$

35. The ratio of the side lengths for a triangle is exactly 15:14:12. In a second triangle similar to the first, the longest side is 10 inches long. To the nearest tenth of an inch, what is the length of the shortest side of the second triangle?
A. 6.4
B. 8.0
C. 9.3
D. 12.0
E. Cannot be determined from the given information

36. If a and b are positive integers such that the greatest common factor of a^2b^2 and ab^3 is 45, then which of the following could b equal?
F. 3
G. 5
H. 9
J. 15
K. 45

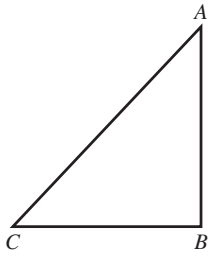
37. The costs of carriage rides of different lengths, given in half miles, are shown in the table below:

Number of half miles	5	6	7	10
Cost	\$8.00	\$8.50	\$9.00	\$10.50

Each cost consists of a fixed charge and a charge per half mile. What is the fixed charge?
A. \$0.50
B. \$1.00
C. \$5.50
D. \$5.00
E. \$1.50

2 △ △ △ △ △ △ △ △ 2

38. The hypotenuse of right triangle ABC shown below is 16 inches long. The sine of angle A is $\frac{3}{5}$. About how many inches long is $\overline{BC}$?



F. 8.0
G. 9.6
H. 12.4
J. 14.3
K. 15.6

39. A circle in the standard (x, y) coordinate plane has center $(12,-5)$ and radius 4 coordinate units. Which of the following is an equation of the circle?
A. $(x-12)^2+(y-5)^2=4$
B. $(x-12)^2-(y+5)^2=4$
C. $(x-12)^2-(y-5)^2=8$
D. $(x-12)^2+(y-5)^2=16$
E. $(x-12)^2+(y+5)^2=16$

40. What is the largest integer value of t that satisfies the inequality $\frac{24}{30} > \frac{t}{24}$?
F. 30
G. 19
H. 18
J. 10
K. 8

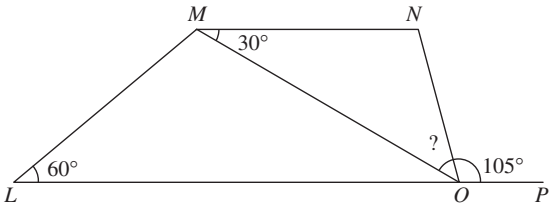
41. What is the distance in the standard (x, y) coordinate plane between the points (5,5) and (1,0)?
A. $\sqrt{26}$
B. $\sqrt{41}$
C. 4
D. 6
E. 16

DO YOUR FIGURING HERE.

2 △ △ △ △ △ △ △ △ 2

DO YOUR FIGURING HERE.

42. In the figure below, *LMNO* is a trapezoid, *P* lies on *LO*, and angle measures are as marked. What is the measure of angle *MON*?



F. 15°
G. 25°
H. 30°
J. 35°
K. 45°

43. In $\triangle ABC$, $AB \cong AC$ and the measure of $\angle B$ is 34°. What is the measure of $\angle A$?
A. 34°
B. 56°
C. 68°
D. 73°
E. 112°

44. In a certain budget, 30% of the money goes toward housing costs, and, of that portion, 20% goes toward rent. If the amount of money that goes toward rent is $630, what is the total amount of the budget?
F. $1,680
G. $2,100
H. $4,095
J. $7,560
K. $10,500

45. What is the matrix product $\begin{bmatrix} 2x \\ 3x \\ 5x \end{bmatrix}$ $[1, 0, -1]$?

A. $\begin{bmatrix} 2x & 0 & -2x \\ 3x & 0 & -3x \\ 5x & 0 & -5x \end{bmatrix}$

B. $\begin{bmatrix} 2x & 0 & -2x \\ 0 & 0 & 0 \\ 10x & 0 & -10x \end{bmatrix}$

C. $[2x \quad 3x \quad 5x]$

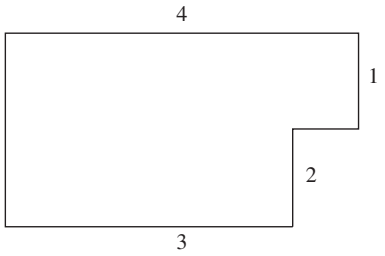
D. $[9x \quad 0 \quad -9x]$

E. $[0]$

2 △ △ △ △ △ △ △ △ 2

DO YOUR FIGURING HERE.

46. In the figure below, all line segments are either horizontal or vertical and the dimensions are given in feet. What is the perimeter in feet, of the figure?

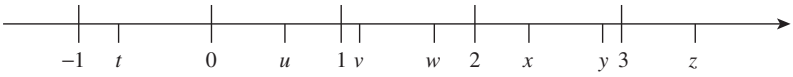


F. 16
G. 14
H. 13
J. 12
K. 10

47. The average of a and b is 6 and the average of a, b, and c is 11. What is the value of c?
A. 21
B. 17
C. 13
D. 8
E. 5

48. The greatest integer of a set of consecutive even integers is 12. If the sum of these integers is 40, how many integers are in this set?
F. 5
G. 6
H. 12
J. 20
K. 40

49. On the number line shown below, t, u, v, w, x, y, and z are coordinates of the indicated points. Which of the following is closest in value to $|w - u|$?



A. t
B. v
C. x
D. y
E. z

2 △ △ △ △ △ △ △ △ 2

50. The length of arc XY of a circle is equal to $\frac{1}{6}$ of the circumference of the circle. The length of the arc is 7π inches. What is the radius, in inches, of the circle?
F. 42
G. 21
H. 14
J. 7
K. 3

51. Let S be the set of all integers that can be written as $2n^2 - 6n$, where n is a nonzero integer. Which of the following integers is in S?
A. 6
B. 30
C. 46
D. 64
E. 80

52. Let the function g be defined by $g(x) = 3(x^2 - 2)$. When $g(x) = 69$, what is a possible value of $2x - 3$?
F. -7
G. -5
H. 2
J. 5
K. 7

53. If $a + b = 25$ and $a > 4$, then which of the following *must* be true?
A. $a = 22$
B. $b < 21$
C. $b > 4$
D. $b = 0$
E. $a < 25$

54. If m, n, and p are positive integers such that $m + n$ is even and the value of $(m+n)^2 + n + p$ is odd, which of the following *must* be true?
F. m is odd
G. n is even
H. p is odd
J. If n is even, p is odd
K. If p is odd, n is odd

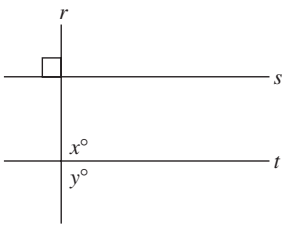
DO YOUR FIGURING HERE.

2 △ △ △ △ △ △ △ △ 2

55. A bag contains only quarters, dimes, and nickels. The probability of randomly selecting a quarter is 1/6. The probability of randomly selecting a nickel is 1/4. Which of the following could be the total number of coins in the bag?
A. 15
B. 24
C. 30
D. 32
E. 40

56. In the xy-coordinate system, if (r,s) and $(r+2, s+t)$ are two points on the line defined by the equation $y = 4x+5$, then $t =$?
F. 4
G. 5
H. 8
J. 9
K. 11

57. In the figure shown below, $s \perp r$ and $x > 90$. Which of the following *must* be true?



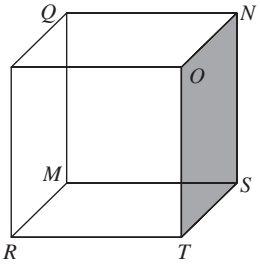
A. $s \parallel t$
B. $r \perp t$
C. $y = 90$
D. $y > 90$
E. $y < 90$

58. Let $x = 2y + 3z - 5$. What happens to the value of x if the value of y decreases by 1 and the value of z increases by 2?
F. It decreases by 2
G. It is unchanged
H. It increases by 1
J. It increases by 2
K. It increases by 4

DO YOUR FIGURING HERE.

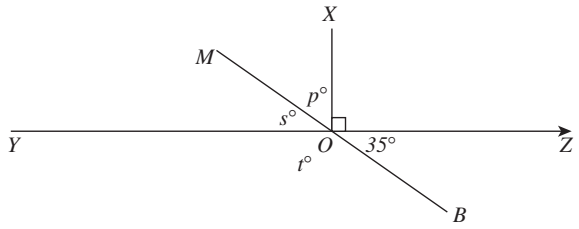
2 △ △ △ △ △ △ △ △ 2

59. On the cube in the figure shown below, each of the following points is the same distance from R as it is from S EXCEPT:



A. M
B. O
C. T
D. Q
E. N

60. In the figure shown below, $\overline{YZ}$ and $\overline{MB}$ intersect at O and $\overline{XO}$ is perpendicular to $\overline{YZ}$. What is the value of $3p + 4s - 2t$?



F. 15°
G. 35°
H. 55°
J. 135°
K. 150°

DO YOUR FIGURING HERE.

END OF THE MATHEMATICS TEST.
STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

3 [redacted] 3

READING TEST

35 Minutes—40 Questions

DIRECTIONS: This test includes four passages, each followed by ten questions. Read the passages and choose the best answer to each question. After you have selected your answer, fill in the corresponding bubble on your answer sheet. You should refer to the passages as often as necessary when answering the questions.

PASSAGE I

PROSE FICTION: *Moving Day*

Two sodas, four candy bars, a packet of trail mix, and one bathroom break later, we'd made it. As far as I was concerned, it was just in time. After spending six hours in the car, my legs were in need of some serious stretching. I opened the door and swung my aching legs over the side of the passenger seat, letting the hot, sticky air hit me like a brick wall. While I'm thankful for the conveniences of the modern car, sometimes even thick, humid air, heavy with pollen and summer sweat, tastes a million times better than stale air conditioning. I could feel my mood begin to improve.

"So, what do you think?"

I turned to look at my husband, John, as he got out of the car, his eyes sparkling as he awaited my response. It was our second trip to the apartment complex in the last three weeks, but this time, there was something different. Three weeks ago, we were simply visitors looking to sign a rental agreement, but now, we were home.

"I like it," I answered, hoping the enthusiasm in my voice would match the sparkle in his eyes. Encouraged, he smiled and turned back to the car.

"We'd better start unloading before it gets too hot," he said.

"Too late. I'm already sweating." I pushed my bangs off my forehead, hoping to prevent my hair from looking absolutely disgusting. John must have noticed, because I caught him looking at me through the rear window.

"Libby, we have an entire car and trailer to unpack. You might as well forget about looking glamorous, at least for now. Besides, it's not like we're back in D.C. No C-Span cameras here!" He chuckled as he said it, but the sparkle had left his eyes.

"Yeah, yeah," I answered, tossing my head as I laughed gamely. I didn't want to lose that sense of optimism—not at the beginning. I stretched my legs out in front of me, hoping it'd make getting out of the car a little bit easier. No such luck. My knees cracked as I stood up, and my calves were tight from the cramped quarters. I'd had no idea my legs would miss the high heels my feet had gladly given up. Suppressing a sigh, I headed towards the trunk to help John unload our life.

We each grabbed an armful and headed towards our new apartment, just a few blocks away from the squat, industrial-looking building where John would start teaching. The fall semester was just a few short weeks away. I'd always thought that university buildings were lofty, ivy-covered brick and stone—at least that's what I was used to. Things were certainly different in the Midwest. After transferring some bags from one arm to the other, I managed to get the front door key out of my pocket. By the time I got the door open, I thought John was going to topple right into the apartment.

There's something monumental about taking your first step into a new home. For John and me, it was our first home we had chosen together. Walking through the door, the bags heavy on my arms, I felt like we were starting the first pages in the next chapter of our lives. When John had asked me to marry him and move to Ohio, I'd had no idea what the future held for us. Now, suddenly, I knew the future had begun. And, just as suddenly, I knew it could be anything we wanted it to be.

"Well, this is it," John said.

"Yep. This is it." Looking around the empty apartment, I realized its beige walls were simply a blank canvas waiting for us to fill it. I felt a thrill of real excitement as a slow grin spread across my face. John saw it and started to relax. He leaned against the doorframe and followed me with his eyes as I traced the outline of the room. It would work. Excited to begin, I turned to John.

"Well, are you ready?" I asked.

"I think so. Are you?" he replied.

"Sure am. Let's go."

With that, we dropped our armfuls in the middle of the living room and headed back to the car for another load. We were home.

3 3

1. The first seven paragraphs establish all of the following about Libby EXCEPT that she:
- **A.** used to live in Washington, D.C.
- **B.** was excited about the move from the beginning.
- **C.** sometimes prefers hot, sticky air to stale air-conditioning.
- **D.** has just rented a new apartment with her husband, John.

2. According to details in the passage, Libby and John most likely moved into their new apartment:
- **F.** in early winter.
- **G.** in late autumn.
- **H.** in early spring.
- **J.** in late summer.

3. Compared to John's initial attitude towards arriving at their new home, Libby's initial reaction is best described as:
- **A.** contrasting; Libby is less enthusiastic about the move.
- **B.** contrasting; Libby resents moving to Ohio.
- **C.** similar; Libby is excited to begin a new life.
- **D.** similar; Libby enjoys long, cross-country trips.

4. Which of the following best describes Libby's reaction to her first steps into her new home?
- **F.** Total fear.
- **G.** Mild dread.
- **H.** Cautious optimism.
- **J.** Real excitement.

5. According to the passage, John's new workplace is all of the following EXCEPT:
- **A.** ivy-covered brick and stone.
- **B.** squat.
- **C.** industrial-looking.
- **D.** close to John and Libby's apartment.

6. Which of the following is NOT an accurate description of the passage?
- **F.** A story about the hardships faced by a young married couple in their first home.
- **G.** A glimpse into the lives of two young people as they enter a new phase.
- **H.** A look at how two people with initially divergent viewpoints reach an understanding.
- **J.** A snapshot of a young couple's journey into a new life together.

7. It is most reasonable to infer from the passage that John would agree with which of the following statements about his wife, Libby?
- **A.** Libby is an important government legislator.
- **B.** Libby misses wearing high-heeled shoes.
- **C.** Libby is somewhat vain.
- **D.** Libby hates living in Ohio.

8. As it is used in the twelfth paragraph, the statement, "Looking around the empty apartment, I realized its beige walls were simply a blank canvas waiting for us to fill it" primarily supports which of the following points implied by the passage?
- **F.** John and Libby will need to work hard to make their new life exciting.
- **G.** John and Libby are starting a new life together filled with exciting potential.
- **H.** The apartment is not what the couple expected.
- **J.** The apartment is industrial looking and needs a fresh coat of paint.

9. The primary point of the first paragraph is that:
- **A.** people often eat junk food on long car trips.
- **B.** the main character prefers hot weather to cool weather.
- **C.** the main character is grateful that her long trip has ended.
- **D.** modern cars have many conveniences, including air conditioning.

10. As it is used in the passage, the phrase *unload our life* (line 44) refers to the:
- **F.** sense of loss Libby and John feel regarding their move.
- **G.** many furniture items contained within the car and trailer.
- **H.** disappointment Libby feels because she had to leave Washington, D.C.
- **J.** significance of the move from Washington, D.C. to Ohio.

GO ON TO THE NEXT PAGE.

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PASSAGE II

SOCIAL SCIENCE: *Defining the Poverty Line: A Political Question*

Poverty is an enduring problem that must be addressed by all modern societies. In fact, some ethicists say a civilization can be judged by how well it treats its least fortunate. By this measure, the United States has much to be proud of. On a national level, the United States has done remarkable work to decrease the suffering of the poor by subsidizing food, housing, and education, and even by giving money directly to those who need it the most. Still, even in the public sector, projects have to be evaluated to see if they are effective. No one can measure the benefits of aid without defining what poverty is, and when someone has been lifted out of it. This leads to one very political question: How exactly should poverty be measured?

The question of poverty is extremely complex. Should it be considered absolute—as a simple matter of the availability of food and shelter—or should it be relative to the goods and services enjoyed by the society as a whole? In other words, if a person can afford a DVD player but not to live in a safe neighborhood, is that person poor? Certainly something as fluid as the economy can affect any number of forces to cause financial suffering—sometimes quite suddenly. Still, according to our federal government, there is a specific measure, the "poverty line," that answers the question. Such a measure was devised in 1963 by government economist Mollie Orshansky, then working for the Social Security Administration under the jurisdiction of the Office of Management and Budget.

Orshansky's statistical measurement was one small part of the federal government's plan to attack the difficult national economic conditions that were hurting millions of Americans in the early 1960s. President Lyndon Johnson labeled the plan the government's "War on Poverty," and it led to such national programs as Head Start, VISTA, and the Jobs Corps. Orshansky developed her poverty threshold from a Department of Agriculture study outlining the cost of nutritionally adequate meals.

From the Agriculture study, Orshansky took the most economic and healthy meal design she could find. She then estimated statistically that the average American family in the 1950s spent approximately one-third of its household income on food; from there, she multiplied by three the cost of the most economically efficient, nutritional diet. This multiplier effect, in theory, produced the level of pre-tax household income at or below which a family should be considered poor. Orshansky's calculation was distributed for use across the government, and the measure came to be known as the poverty line. It has been scaled every year for inflation, and it is adjustable to household size.

Given the decades-old origins of this measure and the limited data available to Orshansky at the time, it is fair to wonder if her standard is still accurate. Studies show that it is not. While families today spend about 12 percent of their income on food—nowhere near the 33 percent assumed in the 1950s—the cost of important budget items, such as housing, transportation, and health care, has increased dramatically. Orshansky's poverty measure, which only takes into account the ability of a household to provide itself with food, is missing several essential components to be accurate in modern society. With over $60 billion in federal aid tied each year to this guideline, not to mention an additional $260 billion in Medicaid spending, the fact is many Americans are still falling deeper into poverty and failing to receive the aid they so desperately need and deserve.

If reform of the measure of poverty used by society is an obvious need, it remains to be seen why such reform has not been forthcoming. The answer lies in the very politics that caused the measure to be created in the first place. Any change in the measured poverty level of a society is an indicator of economic health within that society, and no president has been willing to increase the perceived amount of poverty for a statistical recalculation, no matter how justified. Indeed, some economists say that updating the poverty measure would increase the number of those considered poor, and therefore eligible for government aid, by as much as 2 percentage points. That may not seem significant, but in real terms it means an additional several million people are living below the "poverty line"—whether we count them or not.

11. In the context of lines 46–51, the statement "the measure came to be known as the poverty line" (line 51) is used to support the idea that:

- **A.** poverty can be measured and defined by a single number.
- **B.** poor neighborhoods in the United States are marked off from richer neighborhoods by a metaphorical "line."
- **C.** inflation and household size are the only variables needed to define poverty.
- **D.** poor people often have to stand in line to receive government support.

12. It can be reasonably inferred from the passage that:

- **F.** being poor means not being able to afford a DVD player.
- **G.** Americans have overcome poverty in recent years.
- **H.** defining poverty is complex and difficult to do.
- **J.** lowering the poverty line would not impact the economic health of the U.S.

13. It can reasonably be inferred from the passage that Orshansky estimated that, in the 1950s, the percentage of income that the average American family spent on non-food items was:

- **A.** less than one-third.
- **B.** one-third.
- **C.** between one-third and two-thirds.
- **D.** approximately two-thirds.

GO ON TO THE NEXT PAGE.

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14. Which of the following best expresses the paradox described in the fifth paragraph (lines 53–69)?

F. Americans today have to spend far less of their income on food, which makes them seem richer by Orshansky's measure, but they have to spend far more on other necessary items, which makes them really much poorer.

G. Americans today have far more money than they did in the 1950s, which makes them much richer than they used to be.

H. In America today, ensuring reliable transportation is far more important to families than providing nutritious meals.

J. Orshansky's economic model neglects to account for the cost of modern technology, but it includes a detailed discussion of the modern economy.

15. According to the passage, the impact of Orshansky's economic model on the distribution of federal aid to the poor is that:

A. far more federal money is now available to help the poor.

B. poor people are unaware that they are eligible for $260 billion in Medicaid assistance.

C. legitimately poor people are not receiving the aid they're entitled to receive from the federal government.

D. poor people are not receiving government aid because the government does not know where they live.

16. The author traces Orshansky's economic model back to its origins in:

F. the merger between the Social Security Administration and the Office of Management and Budget.

G. President Lyndon Johnson's "War on Poverty."

H. President Lyndon Johnson's Head Start program.

J. the Civil Rights movement of the early 1960s.

17. The main point of the first paragraph is that:

A. the United States does an excellent job taking care of its poor.

B. poverty is an important issue in society, and it must be measured accurately so that aid can be given effectively.

C. public assistance programs must be eliminated if they are found to be ineffective at alleviating poverty.

D. poverty is an issue that affects few modern societies.

18. According to the passage, which of the following statements is accurate regarding the percentage of income the average American family spends on food?

F. The percentage of income the average American family spends on food has increased dramatically since the 1950s.

G. The average American family now spends most of its money on food.

H. The percentage of income spent on food has decreased from approximately 33% to approximately 12% since the 1950s.

J. The percentage of income spent on food has increased from approximately 12% to approximately 33% since the 1950s.

19. The passage implies that no president has been willing to change the poverty measure for all of the following reasons EXCEPT:

A. no president has been willing to increase the perceived level of poverty.

B. changing the poverty level will increase the number of people eligible for federal aid.

C. no president wants to risk making the economy look less healthy.

D. poverty is an obvious problem and presidents are more concerned with complex problems.

20. According to the passage, Orshansky's role in President Johnson's "War on Poverty" was to:

F. provide a precise measure of the number of poor who needed help in the early 1960s.

G. answer critics who complained that the government was not doing enough to help the poor.

H. provide a precise measure of the number of poor people eligible for Job Corps programs.

J. support the annual budget of the Social Security Administration.

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PASSAGE III

HUMANITIES: *J.R.R. Tolkien and Me*

John Ronald Reuel Tolkien, better known as J.R.R. Tolkien, was many things in his long life, including philologist, writer, and university professor. Of course, today, most people remember him as the author of *The Lord of the Rings*—a monumental work that became an epic film.

A friend introduced me to Tolkien's writings when I was 10 years old. Aileen gave me a copy of *The Hobbit*, and told me her father was reading *The Lord of the Rings* to her and her brother at the dinner table every night after the family had finished eating. I read *The Hobbit* and was hooked. By the time I was 14, I had read every piece of fiction Tolkien had published.

The more I read, the more fascinated I became with not only the world Tolkien had created, but with the man himself. I began to dream of meeting Tolkien. I imagined someday traveling to Oxford University, where he had been a professor of English Language and Literature, and somehow finding the words to tell him how meaningful his writings had been for me.

But, growing up in the Midwest, the possibility of traveling to England seemed very remote. Then I discovered that Tolkien had died years before I'd even started reading *The Hobbit*. I forgot about my dream and got down to the business of school and sports and college applications.

I started college as a chemistry major, but by my sophomore year, I was major-less. Somehow, by my junior year, I was accepted into the Honors English program. This introduced me to the Medieval and Renaissance Collegium (MARC). The director of MARC thought I would be a perfect fit for a new diploma program he was developing—an interim program between undergraduate and graduate work. I applied, was accepted, and found myself faced with my old dream: I was headed to England—to Oxford University, the home of my favorite author!

Oxford isn't set up like most American universities. It's not a single uniform entity. Instead, it's a collection of 39 independent colleges, each with its own internal structure and activities, with an overlying administration that conducts examinations and confers degrees. Tolkien, for example, had been a professor at Merton College. His close friend, C.S. Lewis, taught at Magdalen College (pronounced: Mawdlin). Most students identify with their college, not with the university. This means that pretty much anyone there wearing an Oxford University sweatshirt is a tourist.

I loved Oxford. I loved the tiny streets and the way the trees hid the modern shop fronts, showing only the medieval towers from the rolling hills of a nearby park. Even more, I loved the sense of living history—the way the children would play carelessly under towering trees among centuries-old tombstones in the back-yards of churches, or the stories our housekeeper would tell of Lawrence of Arabia's ghost who, apparently, lived in our own quarters. When inexplicable drafts would sweep through my room, our housekeeper swore it was Lawrence. I loved walking every Tuesday on my way to my folklore tutorial, past the pub—The Eagle and the Child—where Tolkien met with his best friends to discuss their ideas for writing. The sign on the pub allegedly was the inspiration for Bilbo's flight with the Giant Eagles. Best of all, I had a professor who had actually known J.R.R. Tolkien himself.

Sr. Benedicta was a very smart but very kindly, elderly nun. She was no slouch as an academic and had published several highly regarded books in her field. As a colleague, she had spent time with Tolkien when she was newly hired at St. Stephen's College. One day, when she had asked me how I liked studying at Oxford, I decided to tell her about my dream. I told her how, when I was a child, I had wanted so badly to meet Tolkien. I had vividly imagined traveling to Oxford, finding his little cottage, passing through the picket fence, past the rose bushes, to finally knock at the great man's door. I had even imagined him opening it and looking at me. I just could never, ever, think of anything to say that didn't make me feel like a complete idiot.

Sr. Benedicta smiled indulgently at me for a moment, and then said, "He would have encouraged that feeling." Apparently, most people have this impression of Tolkien as a gentle, grandfatherly sort of man, but, unless you were his grandchild, that wasn't actually the case. In person, he was frequently severe and not terribly friendly. I suppose it probably made him a better professor. In the end, I was very glad I finally made my pilgrimage to Oxford, but considered it for the best that I never had a chance to thank J.R.R. Tolkien in person.

21. The point of view from which this passage is narrated is best described as:

- **A.** an adult reflecting on her youth.
- **B.** a parent recalling her daughter's travels.
- **C.** a teenager who aspires to be a writer.
- **D.** Sr. Benedicta, a nun who worked with J.R.R. Tolkien.

22. Which of the following best summarizes the emotional shift that is presented by the narrator in the passage?

- **F.** An adult learns that she doesn't have to meet her heroes for them to leave a profound impression on her.
- **G.** A teenager moves from appreciating fantasy novels to preferring historical fiction.
- **H.** An adult learns that she prefers to visit distant places rather than merely to read about them.
- **J.** A teenager learns first-hand that famous authors are frequently unpleasant individuals.

23. J.R.R. Tolkien is presented by the narrator as being:

- **A.** gentle and grandfatherly.
- **B.** severe but friendly.
- **C.** intelligent but caring.
- **D.** talented but intimidating.

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24. In the seventh paragraph, the narrator's attitude towards Oxford is best described as:
- **F.** exasperated and unimpressed.
- **G.** fond and appreciative.
- **H.** overwhelmed and depressed.
- **J.** disinterested and despondent.

25. In the fourth paragraph, the narrator's attitude toward being unable to meet Tolkien can best be characterized as:
- **A.** relieved.
- **B.** morose.
- **C.** angry.
- **D.** accepting.

26. It can most reasonably be inferred that by telling Sr. Benedicta about her childhood desire to meet J.R.R. Tolkien, the narrator intends to:
- **F.** impress her teacher by showing her dedication to Oxford.
- **G.** illustrate her love of medieval English.
- **H.** create a connection to her childhood hero by talking about him to a mutual friend.
- **J.** pass the time of day with an interesting companion.

27. Which of the following best represents the narrator's initial opinions about J.R.R. Tolkien's writings?
- **A.** The writings were obscure and difficult to follow.
- **B.** The writings were fascinating and made the narrator want to read more.
- **C.** The writings were interesting, but there were far too many to read them all.
- **D.** The most interesting writings were about Oxford, England.

28. When the narrator says, "When inexplicable drafts would sweep through my room, the housekeeper swore it was Lawrence," she means that:
- **F.** the housekeeper believed that Lawrence of Arabia's ghost haunted the student dorms.
- **G.** Lawrence of Arabia was the junior housekeeper in charge of student rooms.
- **H.** the housekeeper was a silly, superstitious woman.
- **J.** the student dorms were very old and drafty.

29. As it is used in line 68, the phrase "she was no slouch as an academic" most nearly means:
- **A.** she had excellent posture when teaching.
- **B.** she had difficulty explaining technical terms.
- **C.** she was an excellent researcher.
- **D.** she was new to her field.

30. As it is used in line 39, the word *uniform* most nearly means:
- **F.** solid.
- **G.** similar.
- **H.** unchanging.
- **J.** consistent.

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PASSAGE IV

NATURAL SCIENCE: *El Niño: A Meteorological Enigma*

Almost any mention of climate change brings thoughts of global warming, complete with mental images of rising seas and melting ice caps. While few reputable scientists contest the reality of global warming, most climatologists are also aware of other powerful meteorological phenomena that shape the weather on a daily, seasonal, or even multi-year basis. In fact, these "background oscillations," or fluctuations, appear to cause major climate shifts every few decades. Among the most influential are the North Pacific Oscillation (NPO), the North Atlantic Oscillation (NAO), the Pacific Decadal Oscillation (PDO), and the El Niño-Southern Oscillation (ENSO). Of these, probably the best-known is the El Niño-Southern Oscillation, popularly called "El Niño."

The term El Niño was first reported in scientific circles in 1892. It originally referred to a local event: an annual, weak, warm ocean current that fishermen discovered along the central western coast of South America. The current was most noticeable around Christmastime, which led to its name because El Niño is Spanish for "little boy" and is frequently used when referring to the Christ Child. (The reverse phenomenon, a cold ocean current, is known by a corresponding term, La Niña, Spanish for "little girl.") Along this area of South America, El Niños reduce the upwelling of cold, nutrient-rich water that sustains large fish populations. Predators such as larger fish and sea birds depend on these populations for survival, as do local fisheries.

As climatology developed as a discipline, scientists discovered that both trends in the current were part of a larger phenomenon affecting global climate patterns, the Southern Oscillation. The definition of El Niño has therefore expanded and continues to change as climate researchers compile more data. Now scientists say that during El Niños, sea-surface temperatures over a large part of the central Pacific climb above normal and stay high for many months. This creates a large pool of warm water that coincides with a change in wind patterns. The shift in wind patterns changes where evaporation takes place. Together, the warm water and shifting wind affect where storms form and where rainfall occurs on a global level.

Most of the time, strong El Niños bring wet winters to the Southwestern United States and milder winters to the Midwest. They tend to bring dry conditions to Indonesia and northern Australia. They generally occur every two to seven years. La Niñas usually, but not always, follow El Niños. During La Niñas, water temperatures in the Central Pacific drop below normal, and weather patterns shift in the other direction. Together, the El Niño and La Niña cycles complete the El Niño-Southern Oscillation (ENSO).

ENSO weather oscillations are discrete from the NPO, NAO, and PDO weather patterns. This means one oscillation does not cause or usually influence the others. Sometimes, however, the various oscillations "beat" together at the same frequency, causing the fluctuations to be synchronized. When this happens, scientists say the resulting weather can be intensified.

Weather effects can be damaging. The warming patterns of El Niño are one of the leading causes of natural damage to coral reefs, while wider ENSO fluctuations may cause flooding or drought to occur on land. In these cases, extreme shifts can cause economic pressure by disrupting entire fishing industries or damaging crops.

Sometimes, pressure caused by intense weather can have unexpected political effects. Some scientists argue that unusually cold weather brought by a strong El Niño phenomenon caused significant crop damage in 1788–89, which many say contributed to the French Revolution. Other climate researchers claim that strong oscillation coupling, combined with strong El Niños in the late 1930s and early 1940s, led to a profound cold snap in Northern Europe in the middle of the Second World War. The scientists argue that this unexpected cold snap significantly contributed to the failure of Germany to capture Moscow, which changed the course of World War II.

ENSO phenomena, along with the other three oscillations, are separate from those attributed to global warming. The causes are completely independent. However, because El Niño and global warming both can result in strong temperature variability, disruptive rain distribution, and extreme damage to a variety of ecosystems, any synchronicity will be closely observed by scientists seeking to document the total effects of each.

31. The main purpose of the passage is to:

- **A.** explain the weather pattern known as El Niño and describe its effects.
- **B.** argue that El Niños are a far more significant source of weather change than global warming.
- **C.** discuss the four meteorological patterns that form global weather.
- **D.** describe how scientists study the weather.

32. It can reasonably be inferred from the passage that scientists began to show interest in El Niño weather patterns during which of the following decades?

- **F.** 1780s
- **G.** 1890s
- **H.** 1930s
- **J.** 1990s

33. As presented in the passage, the statements in lines 49–81 are best characterized as:

- **A.** facts based on careful historical and scientific documents.
- **B.** speculation based on rumor and hearsay.
- **C.** hypotheses supported by evidence.
- **D.** estimates based on data.

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34. The author uses the information in parentheses in lines 23–25 primarily to:
- **F.** present information related to the topic, but not immediately relevant to the paragraph.
- **G.** suggest that La Niña is less important than El Niño.
- **H.** support the use of Spanish terminology in meteorological research.
- **J.** imply that La Niña phenomena were discovered considerably later than El Niño.

35. Based on the passage, some scientists speculate that when weather oscillations "beat" at the same frequency, the resulting weather:
- **A.** is frequently neutralized.
- **B.** is milder than normal.
- **C.** is unusually cold.
- **D.** is often intensified.

36. The main purpose of the third paragraph is to:
- **F.** provide a history of 20th century climatology.
- **G.** explain why meteorological predictions are often inaccurate.
- **H.** describe how modern climatologists define El Niño phenomena.
- **J.** show how climatologists know where rainfall will occur worldwide.

37. Suppose that a scientist was trying to determine if a given year in the past had been an El Niño year. Which of the following would most likely indicate an El Niño weather pattern?
- **A.** Reports of unusually wet weather in Southern California and reports of drought in Darwin, Australia.
- **B.** Reports of ice storms in Wisconsin and Michigan.
- **C.** Reports of flooding in Jakarta, Indonesia and reports of unusually dry weather in Africa.
- **D.** Reports of drought in New Mexico and Texas.

38. Based on the passage, how should the claim that "pressure caused by intense weather can have unexpected political effects" (lines 69–70) most likely be interpreted?
- **F.** People are more likely to attend indoor political rallies in poor weather.
- **G.** Severe weather caused problems that changed the political landscape of modern Europe.
- **H.** In the 18th century, people frequently blamed their political leadership when weather turned bad.
- **J.** A series of particularly severe El Niños caused Germany to lose World War II.

39. According to the passage, all of the following are negative consequences of El Niño weather patterns EXCEPT:
- **A.** damage to coral reefs.
- **B.** flooding.
- **C.** drought.
- **D.** increases in large fish populations.

40. The author makes which of the following comparisons between El Niño and global warming?
- **F.** El Niño patterns and global warming have nothing to do with one another, and have no effect on global weather.
- **G.** El Niño patterns and global warming have the same underlying causes.
- **H.** The effects of El Niño patterns and global warming are easy to confuse.
- **J.** El Niño patterns and global warming are completely independent, but often have the same effects on global weather.

END OF THE READING TEST.
STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

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SCIENCE REASONING TEST

35 Minutes—40 Questions

DIRECTIONS: This test includes seven passages, each followed by several questions. Read the passage and choose the best answer to each question. After you have selected your answer, fill in the corresponding bubble on your answer sheet. You should refer to the passages as often as necessary when answering the questions. You may NOT use a calculator on this test.

PASSAGE I

In recent decades, astronomers deduced that there is approximately five times more material in clusters of galaxies than expected based on visible galaxies and hot gas. Most of the material in these galaxies is, in fact, invisible. Since galaxies are the largest structures in the universe held together by gravity, some scientists concluded that most of the matter in the entire universe is invisible. They called this invisible material dark matter. Two scientists offer theories on whether dark matter exists.

Scientist 1

Recent studies by researchers at Northeastern University and the University of Victoria may suggest that dark matter—a substance previously considered viable in light of Newton's theories of gravity—does not actually exist. Dark matter is not readily observable because it does not directly refract light or energy. Its existence could only be deduced because of the perceived gravitational effect that it has on surrounding matter.

This new research is based upon Einstein's theory of general relativity. Although Newtonian physics may provide for the cohesive nature of solar systems, when applied to galaxies the 'numbers' do not add up. Because there is not enough visible matter for the various gravitational equations to balance, dark matter was theorized to make up this deficit. Without a source for the rest of the missing matter, there was previously nothing in Newtonian physics to explain the movement or shape of galaxies.

In terms of general relativity, a galaxy, seen collectively, has its own gravity and essentially drives its own rotation at a constant rate. Aaron Romanowsky of Harvard University and several colleagues point to the existence of several elliptical-shaped galaxies surrounded by very little dark matter as evidence that dark matter is not, in fact, the cause of the warped galaxies. The results of their studies cast doubt on some of the conventional theories of galaxy formation and manipulation.

This theory does not explain everything, such as how large clusters of galaxies are able to bind to one another, but it does allow for already proven equations to explain the motion of galaxies without dark matter.

Scientist 2

Without dark matter, there are many cosmological phenomena that are difficult to explain. Some scientists believe that the interaction between dark matter and other smaller, nearby galaxies is causing the Milky Way galaxy to take on a warped, elliptical profile. This interaction involves two smaller galaxies (called Magellanic Clouds) near the Milky Way, moving through an enormous amount of dark matter, which in effect enhances the gravitational pull that the two Magellanic Clouds could exert on the Milky Way and other surrounding bodies. Computer models from the University of California at Berkeley seem to support this theory. Without the existence of the dark matter, the Magellanic Clouds would not have sufficient mass to have such a strong effect on the bend of the Milky Way galaxy.

The strongest evidence for the validity of this hypothesis rests in Newtonian physics and the hypothesis that anything with mass will exert a gravitational pull. However, there is nothing readily observable in the vicinity of the Milky Way with sufficient mass that could cause such a high level of distortion via gravitational pull.

In addition, theoretical arguments for the existence of dark matter can be made by looking at the cosmic microwave background in the universe. This "leftover" light radiation, emitted only a few hundred thousand years after the formation of the universe, provides information about conditions in the universe on a very large scale. Measurements of cosmic microwave radiation imply the existence of dark matter, although even dark matter cannot solve all of the mysteries of the universe.

1. Which of the following statements is most consistent with Scientist 1's viewpoint?

- **A.** The application of the theory of general relativity to observed phenomena requires the inclusion of dark matter.
- **B.** Einstein invented dark matter to cover up deficiencies in his theory of relativity.
- **C.** Newton's theories are completely dependent upon the proven existence of dark matter in the universe.
- **D.** New research shows that dark matter is not required to explain astronomers' observations.

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2. According to the passage, a similarity between the two viewpoints is that both scientists believe that:
- **F.** dark matter has little to no effect on galaxy shape.
- **G.** there are still many unexplained cosmological phenomena.
- **H.** cosmic microwave radiation suggests the presence of dark matter.
- **J.** dark matter can be easily observed in the universe.

3. Which of the following best summarizes Scientist 2's position?
- **A.** The existence of dark matter is a scientific fraud perpetrated by astronomers and physicists.
- **B.** The existence of dark matter is probable based on currently available evidence.
- **C.** Dark matter is misnamed because it is visible using modern instruments.
- **D.** Dark matter is no longer a necessary part of the general theory of relativity.

4. With which of the following statements would both Scientist 1 and Scientist 2 most likely agree?
- **F.** Astronomical observations of the known universe are of no value when it comes to explaining the shape of the Milky Way.
- **G.** Warped galaxies are a convenient fiction created by astronomers and physicists.
- **H.** Newtonian physics can account for the existence of warped galaxies without resorting to dark matter as part of the explanation.
- **J.** Warped galaxies such as the Milky Way present an astronomical puzzle that is worth investigating.

5. Scientist 2's position would be most weakened by which of the following observations?
- **A.** The Magellanic Clouds actually move more quickly than previously thought.
- **B.** The Magellanic Clouds are actually much more massive than previously thought.
- **C.** The Milky Way is warped more than previously thought.
- **D.** U.C. Berkeley computer models are much more accurate than previously thought.

6. According to the passage, the main point of the disagreement between Scientist 1 and Scientist 2 is:
- **F.** the existence of dark matter in the universe.
- **G.** the source of dark matter in the universe.
- **H.** the likelihood that Einstein was aware of Newton's theories.
- **J.** the existence of the Magellanic Clouds near the Milky Way.

7. Scientist 1's position would be most weakened by:
- **A.** the revelation that Einstein's general theory of relativity is significantly flawed.
- **B.** the appearance of several newly-discovered warped galaxies similar to the Milky Way.
- **C.** the discovery that previous estimates of the mass of galaxies were too high.
- **D.** proof that Einstein was aware of Newton's theories at the time he postulated his general theory of relativity.

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PASSAGE II

Asian soybean rust (ASR) is a disease caused by the fungus *Phakospora pachyrhizi*. ASR spreads by windborne spores that infect soybean leaves. As rust lesions mature, they produce thousands of additional spores. Over time, large spore loads build up within fields and across large geographical areas. In 2004, this disease was detected in nine states in the American southwest, and by 2005 it had invaded several other states. ASR can drastically reduce crop yields in areas where it commonly occurs, so monitoring and application of preventive measures such as fungicide will likely be necessary.

Certain fungicides have been tested for their effectiveness against ASR. These fungicides are listed in Table 1. The simplest classification of fungicides divides them into three categories: contact, locally systemic, and systemic. Properties of these fungicide categories are given in Table 2.

Table 1

Fungicide	Category
chlorthalonil	Contact
boscalid	Contact
azoxystrobin	Locally systemic
pyraclostrobin	Locally systemic
myclobutanil	Systemic
tebuconazole	Systemic

Table 2

Fungicide category	Properties
Contact	protectant only; no penetration of leaf tissue; active only on the surface
Locally systemic	absorbed into leaf; does not spread from leaf to which it was applied
Systemic	absorbed into leaf tissue and plant xylem; translocated throughout the plant

ASR infections generally begin in the lower leaf canopy where humidity is higher and leaves stay wet for longer periods. For this reason, the lower soybean leaf canopy is the primary spray target. Both upper and lower leaf surfaces must be sprayed. Coverage as dense as 400 spray droplets per square inch is considered ideal.

The different properties of fungicide types have important implications for spray application. Contact and locally systemic fungicides require better spray coverage than systemic fungicides. Contact fungicides, because they do not penetrate the plant tissue, are more easily washed off the leaf by rain. This results in a shorter residual control period and more frequent re-application of the fungicide.

Tests have shown that fungicides effectiveness varies based on the soybean growth stage at which the fungicide is applied. Figure 1 identifies some of the different stages of soybean growth. Soybean leaves can be infected at any time with ASR. However, research has shown that the most critical time to protect soybean plants with fungicides is from the R1 through R5 growth stages. Fungicide applications should not be initiated after the R5 growth stage (seed development and mature plant).

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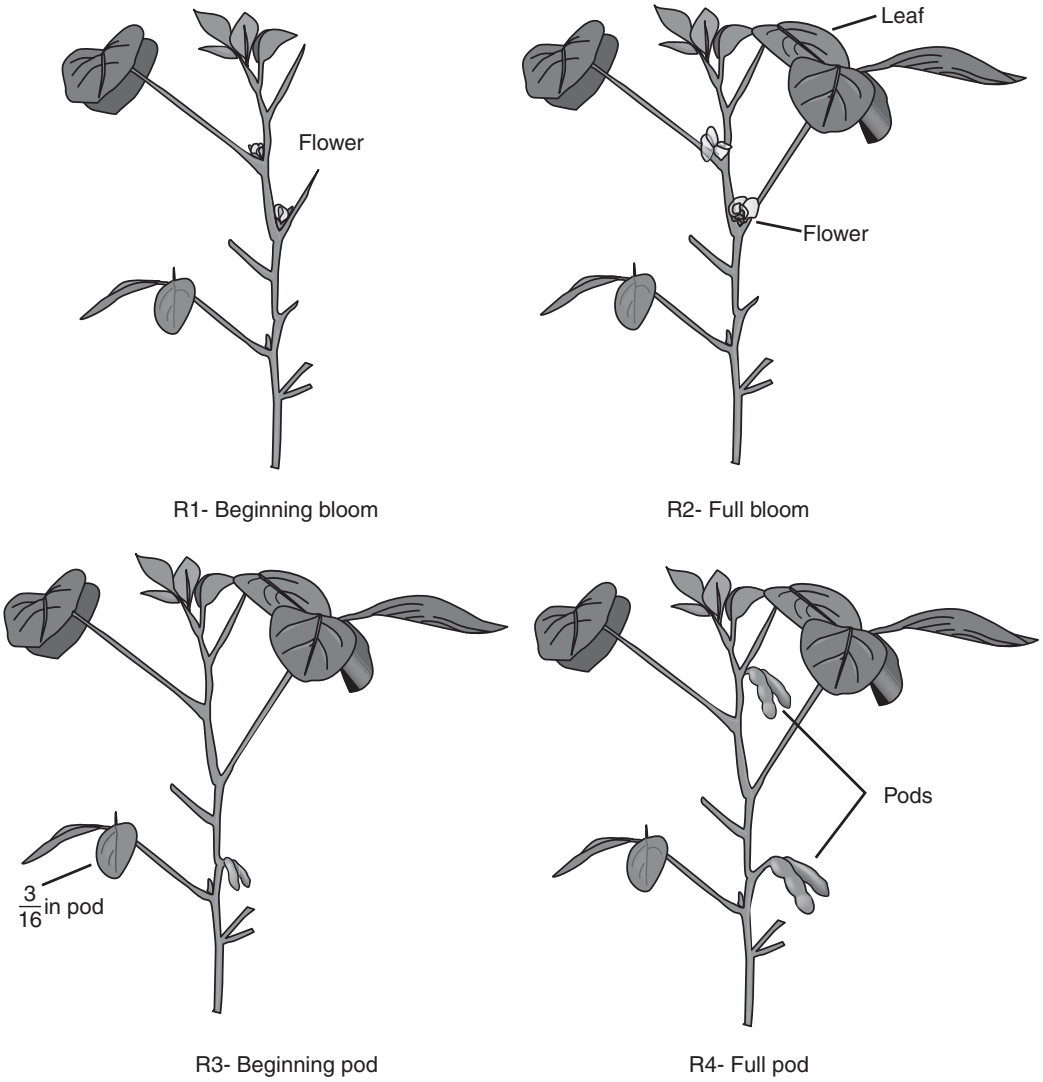

Figure 1

8. According to the passage, which of the following fungicides should be reapplied frequently?
- **F.** *boscalid*
- **G.** *azoxystrobin*
- **H.** *pyraclostrobin*
- **J.** *tebuconazole*

9. Based on the information provided, during which stage of growth will the application of *chlorthalonil* be least effective?
- **A.** R1
- **B.** R3
- **C.** R6
- **D.** *Chlorthalonil* should not be applied during any growth stage.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

10. A student claimed that, "Application of a systemic fungicide will only prevent the growth of fungi if applied after Growth Stage 5." Does the passage support this claim?

F. No; systemic fungicides are active only on the surface of the leaf.
G. No; fungicides are most effective when applied between Growth Stage 1 and Growth Stage 5.
H. Yes; systemic fungicides are most effective when applied during Growth Stage 6, but not before.
J. Yes; soybean plants can only be infected with ASR late in their development.

11. According to the passage, if fewer than 400 spray droplets per square inch of *tebuconazole* were applied during Growth Stage 2, the chances that the soybean plants would become infected with ASR would most likely:

A. not be affected.
B. decrease only.
C. decrease, then increase.
D. increase only.

12. Equal amounts of *azoxystrobin*, *boscalid,* and *myclobutanil* were applied to three different soybean plants during Growth Stage 3. After 24-hours, each of the plants was sprayed with water. Based on the data, which of the following represents the order, from least effective to most effective, of the fungicides' likelihood of preventing ASR?

F. *myclobutanil*, *azoxystrobin*, *boscalid*.
G. *azoxystrobin*, *boscalid, myclobutanil*.
H. *boscalid, azoxystrobin*, *myclobutanil*.
J. *myclobutanil*, *boscalid*, *azoxystrobin*.

13. According to Figure 1, during which of the following stages in the growth of a soybean plant should fungicide NOT be applied?

A. Beginning flower.
B. Full seed.
C. Full flower.
D. Beginning pod.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

PASSAGE III

Echinoderms are defined as any of a variety of invertebrate marine animals characterized by a hard, spiny covering or skin. They have attracted much attention due to their extensive fossil record, ecological importance, and bizarre body forms. Most echinoderms are extinct, but many living representatives still exist. All living echinoderms have an internal skeleton and a central cavity, but the outward appearance can vary significantly. For example, starfish and brittle stars have arms that extend from a central disk; sea lilies have a central stalk, or stem, and resemble flowers; sea cucumbers are wormlike and tend to burrow.

The ways in which echinoderms move and feed are as diverse as their body forms. Table 1 lists certain echinoderms and their methods of locomotion (movement) and feeding.

Table 1

Echinoderm	Locomotion method	Feeding method
Asteroid (starfish)	"walks" using spines and tube feet	predatory; exudes stomach through mouth to capture prey
Ophiuroid (brittle star)	thrashes and rows its arms	suspension feeder; catches small organisms with its arms
Holothurian (sea cucumber)	contracts and expands body; some use of tube feet	swallows mud and sand; digests organic material and ejects remainder
Crinoid (sea lilies)	swims by raising arms up and down	suspension feeder; fans arms out to catch passing plankton

Table 2 includes examples of echinoderm habitats around the world.

Table 2

Echinoderm	Habitats
Starfish	rocky shores, sandy areas, waterlogged wood on the deep-sea floor
Brittle star	rocky shores, sandy areas
Sea cucumber	rocky shores, sandy areas, deep ocean trenches
Sea lilies	offshore mud and ooze

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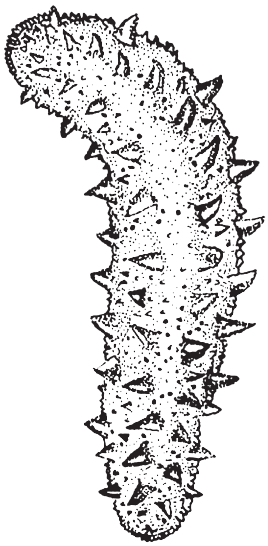
14. The echinoderm shown below is most likely a:



F. sea lily.
G. starfish.
H. sea cucumber.
J. brittle star.

15. According to Table 1 and Table 2, *crinoids* can be found feeding on plankton:
A. near the shore.
B. in deep ocean trenches.
C. in offshore mud and ooze.
D. on the deep-sea floor.

16. Based on the data provided in the passage, sea cucumbers most likely burrow in order to:
F. locate food.
G. avoid worms.
H. move offshore.
J. shed their spines.

17. Suppose scientists discover a new echinoderm that uses its tube feet to move across the deep-sea floor as it hunts for prey. This newly discovered echinoderm can most likely be classified as a(n):
A. *crinoid*.
B. *asteroid*.
C. *ophiunoid*.
D. *holothurian*.

18. A student hypothesized that large populations of sea cucumbers could greatly alter the physical and chemical composition of the sea floor. Is this hypothesis supported by the data in the passage?
F. Yes; sea cucumbers often prey upon commercially important organisms, such as oysters.
G. Yes; sea cucumbers feed by swallowing sediment, extracting organic matter, and ejecting the remainder.
H. No; sea cucumbers cannot burrow into the sediment, so will not affect the composition of the sea floor.
J. No; sea cucumbers do not have a viable method of locomotion.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

PASSAGE IV

Students wanted to test the effects of nutrition on the growth of guinea pigs. Two experiments were conducted using different feeds and vitamin supplements. For both experiments, four groups of 10 guinea pigs each were given a different type of feed over an 8-week period. Each group received the same quantity of food and was provided with fresh water daily. The guinea pigs were measured and weighed weekly. The guinea pigs in each group had an average starting weight of 50 grams (g) and an average starting length of 20 centimeters (cm).

Experiment 1

Group 1 was fed a high-protein feed (Feed P).
Group 2 was fed a grain-based feed with vitamin supplements (Feed Q).
Group 3 (control group) was fed a grain-based feed without supplements (Feed R).
Group 4 was fed a grain-based feed without supplements plus fruits and vegetables (Feed S).

The results and average measurements are recorded in Table 1 below.

Table 1

Group	Average weight after 8 weeks (g)	Average length after 8 weeks (cm)
1	93	32.50
2	82	29.00
3	74	25.25
4	76	23.00

Experiment 2

Group 5 was fed a high-protein feed plus fruits and vegetables (Feed V).
Group 6 was fed a grain-based feed with vitamin supplements plus fruits and vegetables (Feed W).
Group 7 (control group) was fed a grain-based feed without supplements (Feed X).
Group 8 was fed a grain-based feed without supplements plus fruits only (Feed Y).

The results and average measurements are recorded in Table 2 below.

Table 2

Group	Average weight after 8 weeks (g)	Average length after 8 weeks (cm)
5	98	38.25
6	85	30.50
7	75	25.00
8	74	23.25

19. Based on the results of the experiments, which feed resulted in the greatest weight gain?
A. Feed P.
B. Feed S.
C. Feed V.
D. Feed Y.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

20. Based on the results of Experiment 1, the guinea pigs in the group that was fed a grain-based feed with vitamins gained how much weight, on average, during each week of the experiment?
- **F.** 29 grams.
- **G.** 11 grams.
- **H.** 10 grams.
- **J.** 4 grams.

21. If the students added vitamin supplements to Feed V for a new group (Group 9), what might the result be after 8 weeks?
- **A.** The guinea pigs in Group 9 would weigh less than those in Group 5.
- **B.** The guinea pigs in Group 9 would weigh less than those in Group 6.
- **C.** The guinea pigs in Group 9 would have a greater average length than those in Group 5.
- **D.** The guinea pigs in Group 9 would have a shorter average length than Group 6.

22. Which of the following statements is true, according to Table 2?
- **F.** Feed W produces guinea pigs that are almost twice as long as those in the control group.
- **G.** Feed V produces guinea pigs that weigh three times as much as those in the control group.
- **H.** Feed Y produces guinea pigs with the greatest average length.
- **J.** Feed X produces guinea pigs similar to those produced by Feed Y.

23. From the results of the experiments the students would hypothesize that the guinea pigs in Groups 3 and 4 are similar because:
- **A.** the control group was fed larger quantities of food.
- **B.** the fruits and vegetables given in Experiment 1 did not have a very high nutritional value.
- **C.** neither group received enough high-protein food.
- **D.** the vitamin supplements given in Experiment 2 were more potent than those given in Experiment 1.

24. According to the passage, the guinea pigs in which of the following groups showed the least overall growth?
- **F.** Group 8.
- **G.** Group 7.
- **H.** Group 4.
- **J.** Group 1.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

PASSAGE V

Students studied the effect of temperature on the conversion rates of two organic acids to their corresponding alcohols. The two organic acids studied were lactic acid (LA) and propionic acid (PA). Each acid was mixed with an Ru/C catalyst (to start the conversion) in an aqueous (water) solution. Lactic acid was found to break down into propylene glycol (PG), water, and various carbon side products. Propionic acid was found to break down into 1-propanol (1-PrOH), water, and various carbon side products. For all experiments, temperature was measured in degrees Kelvin (K).

Experiment 1

Students mixed an LA concentration of 0.5 moles (M) in a 50-milliliter (ml) aqueous solution along with a 5% Ru/C catalyst. The temperature was then varied to study the effect on the rate of conversion from lactic acid to PG. The results are shown in Figure 1.

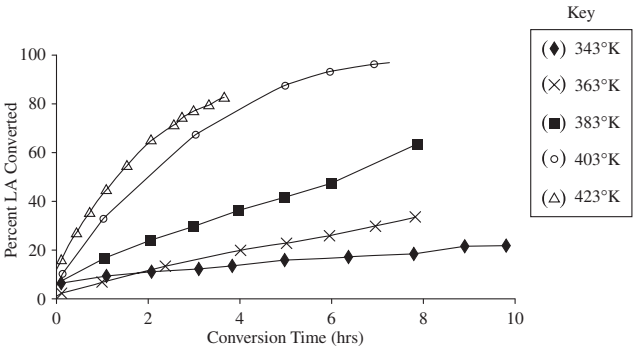


Figure 1

Experiment 2

Students mixed a PA concentration of 0.5 M in a 50 ml aqueous solution along with a 5% Ru/C catalyst. The temperature was then varied to study the effect on the rate of conversion from propionic acid to 1-PrOH. The results are shown in Figure 2.

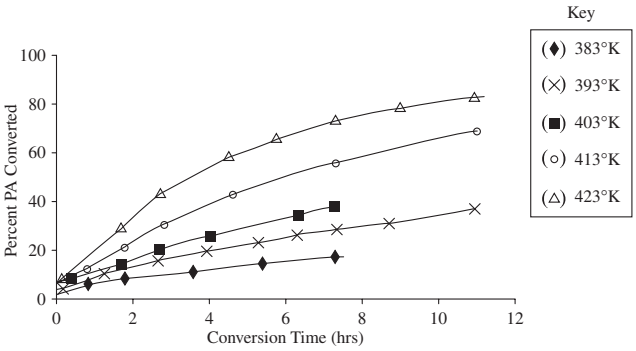


Figure 2

25. According to Figure 1, after two hours at 403°K, the percent of LA converted was closest to which of the following?
- **A.** 10%.
- **B.** 50%.
- **C.** 80%.
- **D.** 100%.

26. According to Figure 1, at 423°K, the greatest percentage of conversion occurred during which of the following time intervals?
- **F.** 8 to 10 hours.
- **G.** 6 to 8 hours.
- **H.** 2 to 4 hours.
- **J.** 0 to 2 hours.

27. Which of the following was held constant in each of the experiments?
- **A.** The amount of catalyst used.
- **B.** The temperature.
- **C.** The conversion rates.
- **D.** The type of acid used.

28. Based on the data in Tables 1 and 2, which of the following best describes the results of the experiments? As conversion time increased, the percent of acid converted:
- **F.** decreased at some temperatures only until conversion stopped.
- **G.** increased at some temperatures only until conversion stopped.
- **H.** decreased at all temperatures until conversion stopped.
- **J.** increased at all temperatures until conversion stopped.

29. A chemist claimed that the propionic acid conversion rate at 403°K dramatically increases between 8 and 12 hours. Do the results of the experiments support this claim?
- **A.** No; according to Figure 2, conversion stops after 8 hours and does not reach 100%.
- **B.** No; according to Figure 1, nearly 100% of the acid has been converted after 8 hours.
- **C.** Yes; according to Figure 1, there is a significant increase in the conversion rate after 8 hours.
- **D.** Yes; according to Figure 2, less than 50% of the acid has been converted after 8 hours.

30. Based on the results of Experiment 2, assuming that conversion of PA at 423°K continued until it reached 100%, one could predict that 100% of the PA would be converted during which of the following time intervals?
- **F.** < 2 hours.
- **G.** 4 to 6 hours.
- **H.** 12 to 14 hours.
- **J.** < 12 hours.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

PASSAGE VI

Carbon monoxide (CO) is a colorless, odorless gas produced by burning material that contains carbon, such as coal or natural gas. Carbon monoxide is the leading cause of accidental poisoning deaths in America. The Centers for Disease Control estimates that carbon monoxide poisoning claims nearly 500 lives and causes more than 15,000 visits to hospital emergency departments annually. Common household appliances produce carbon monoxide. When not properly ventilated, carbon monoxide emitted by these appliances can build up. The only way to detect carbon monoxide is through testing, using a specialized sensing device.

Gas stoves have been known to emit high levels of carbon monoxide. Average carbon monoxide levels in homes without gas stoves vary from 0.5 to 5.0 parts per million (ppm). Levels near properly adjusted gas stoves are often 5.0 to 15.0 ppm and those near poorly adjusted stoves may be 30.0 ppm or higher. CO levels between 0.5 and 15.0 ppm are considered safe.

Table 1 shows the carbon monoxide levels in ppm for each of five homes, with and without gas stoves.

Table 1

Home	Carbon monoxide level (ppm)
5	<1.0
4	1.0 to 5.0
3	5.0 to 15.0
2	15.0 to 25.0
1	>25.0

31. According to the passage, which of the following homes listed in Table 1 most likely has a poorly adjusted gas stove?
- **A.** 5
- **B.** 4
- **C.** 3
- **D.** 1

32. A sensing device was installed in Home 2 to test CO levels. Which of the following is most likely true about the results of the test?
- **F.** The results indicated below average CO emissions.
- **G.** The results indicated above average CO emissions.
- **H.** The results indicated average CO emissions.
- **J.** The results indicated no CO emissions.

33. According to the passage, which of the following carbon monoxide levels would be considered most harmful?
- **A.** 40.25 ppm
- **B.** 12.00 ppm
- **C.** 6.50 ppm
- **D.** 0.30 ppm

34. According to the passage, if Home 4 has a gas stove, should it be removed?
- **F.** Yes, because it is emitting a high level of carbon monoxide.
- **G.** Yes, because it is not properly adjusted.
- **H.** No, because carbon monoxide levels in the house are within a safe range.
- **J.** No, because there is no indication of any carbon monoxide emissions.

35. Suppose a 6th home was tested for carbon monoxide and the results showed a carbon monoxide level of 10.0 ppm. According to the passage, which of the following conclusions can be reached?
- **A.** The residents of Home 6 are highly susceptible to CO poisoning.
- **B.** Home 6 has a poorly adjusted gas stove that should be repaired or removed.
- **C.** The CO levels in Home 6 will not pose any danger to the residents.
- **D.** The CO sensing device is defective and should be replaced.

GO ON TO THE NEXT PAGE.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

PASSAGE VII

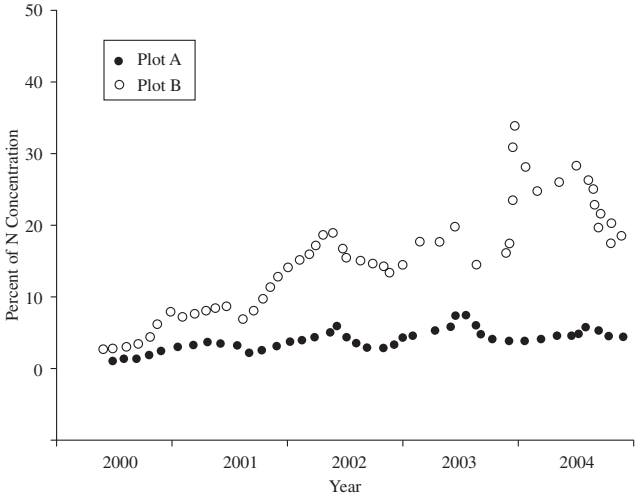
Turf grasses are used throughout the United States in many suburban lawns. Kentucky bluegrass is the most common type of turf grass used in the northern part of the United States. To keep lawns green and healthy, many homeowners apply fertilizer up to five times a year. Inorganic fertilizers are becoming more popular, and contain three common elements – nitrogen, phosphorous, and potassium – for the development of plant color, strength, and health. Most turf grass lawns do not use all of the nutrients provided in the fertilizer, which means that much of the nitrogen, phosphorous, and potassium remains in the soil. When water enters the soil, it accumulates a portion of the excess nitrogen from the soil. This water, now termed *leachate*, flows into surrounding waterways. The leaching of high concentrations of nitrogen into natural waterways can throw off the environmental equilibrium of the aquatic ecosystem, often resulting in an increase in plant growth that can have a negative impact on the native fish populations.

A study was performed to examine the degree of nitrogen leaching in Kentucky bluegrass turf; 2 one-acre plots of turf were compared. The scientists conducting the study relied completely on natural rainwater to irrigate the test plots. Each plot received fertilizer applications containing different levels of nitrogen two times per week during the months of April and September for 5 years. The plots had a 5% slope to facilitate leaching; leachate was collected in one-liter jugs. The leachate collected from each plot was measured for nitrogen concentration.

Plot A, received a low nitrogen application, 98 kilograms of N per acre from 2000 to 2004. Plot B, received an initially high nitrogen application, 245 kilograms of N per acre from 2000–2002. In the last year of the study, the amount of nitrogen in the fertilizer was decreased to 196 kilograms of N per acre for Plot B. Table 1 shows the average nitrogen concentration in milligrams per liter (mg/L) in the leachate collected from each plot during each year. Figure 1 shows the percent concentration of nitrogen in the leachate.

Table 1

Year	N concentration (mg/L)	
	Plot A	Plot B
2000	2.1	14.7
2001	3.7	18.9
2002	4.8	25.3
2003	6.3	29.7
2004	2.6	11.8



36. According the passage, as the amount of nitrogen in the fertilizer increased, the average amount of nitrogen in the leachate:
- **F.** decreased only.
- **G.** increased only.
- **H.** decreased for several years, then increased.
- **J.** increased for several years, then decreased.

37. Based on the data in Table 1 and Figure 1, one can conclude that when fertilizer with a low nitrogen concentration is applied, native fish populations in surrounding waterways will most likely:
- **A.** remain stable.
- **B.** be reduced by 5%.
- **C.** be completely decimated.
- **D.** not have enough food.

38. It was determined that during times of heavy rain, more nitrogen was leached from the soil. Based on the results of the study, which year most likely had times of heavy rain in April and September?
- **F.** 2000.
- **G.** 2001.
- **H.** 2003.
- **J.** None.

4 ○ ○ ○ ○ ○ ○ ○ ○ ○ 4

39. According to the Environmental Protection Agency, average nitrogen levels in leachate must be less than 10 mg/L to be safe for the environment. Based on this standard and the results of the study, which of the following fertilizer applications is considered safe?

A. 196 kilograms of N per acre.
B. 98 kilograms of N per acre.
C. 245 kilograms of N per acre.
D. None of the tested applications is safe.

40. In 2005, it was found that average nitrogen levels in the leachate from Plot B were 8.2 mg/L. The data from the study supports which of the following conclusions?

F. Kentucky bluegrass should not be used for lawns in suburbs near a public waterway.
G. Once high-nitrogen fertilizer has been applied to a suburban lawn, nitrogen levels in the leachate will remain high, even if low-nitrogen fertilizer is later applied.
H. Following the application of low-nitrogen fertilizers, it will take more than one year to reach safe nitrogen levels in leachate from suburban lawns previously fertilized with high-nitrogen fertilizer.
J. The measurable concentration of nitrogen in leachate from suburban lawns will always be within the range considered safe by the Environmental Protection Agency, as long as irrigation is kept to a minimum.

END OF THE SCIENCE REASONING TEST.
STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

WRITING TEST PROMPT

DIRECTIONS: This test is designed to assess your writing skills. You have 30 minutes to plan and write an essay based on the stimulus provided. Be sure to take a position on the issue and support your position using logical reasoning and relevant examples. Organize your ideas in a focused and logical way, and use the English language to clearly and effectively express your position.

When you have finished writing, refer to the Scoring Rubrics discussed in the Introduction (page 4) to estimate your score.

Some educators have recently banned students from exhibiting visible piercings and tattoos on high school property. They feel that body art, as it is called, distracts student attention from the main purpose of high school, which is education. Tattoos and piercings, they argue, can create an atmosphere of intimidation. Others feel that body art, like other art, should be protected under the law as freedom of expression. They argue that students should be allowed to exhibit visible piercings and tattoos on school property as long as the work is not obscene. In your opinion, should students be banned from exhibiting visible piercings and tattoos on school property?

In your essay, take a position on this question. You may write about either one of the two points of view given, or you may present a different point of view on this question. Use specific reasons and examples to support your position.

ANSWER KEY

English Test

1. A	21. D	41. A	61. A
2. F	22. F	42. H	62. G
3. C	23. B	43. D	63. D
4. H	24. H	44. F	64. H
5. A	25. D	45. D	65. B
6. G	26. H	46. J	66. H
7. C	27. A	47. A	67. C
8. F	28. J	48. G	68. J
9. D	29. D	49. D	69. A
10. G	30. H	50. H	70. G
11. D	31. B	51. B	71. C
12. G	32. F	52. J	72. J
13. B	33. A	53. C	73. A
14. F	34. J	54. F	74. J
15. C	35. A	55. C	75. A
16. G	36. J	56. F	
17. A	37. B	57. B	
18. F	38. H	58. G	
19. B	39. A	59. C	
20. F	40. G	60. J	

Mathematics Test

1. C	21. B	41. B
2. J	22. F	42. K
3. B	23. E	43. E
4. G	24. H	44. K
5. B	25. B	45. A
6. G	26. K	46. G
7. E	27. D	47. A
8. J	28. H	48. F
9. E	29. B	49. B
10. F	30. K	50. G
11. B	31. E	51. E
12. K	32. F	52. K
13. B	33. D	53. B
14. F	34. G	54. J
15. C	35. B	55. B
16. H	36. F	56. H
17. B	37. C	57. E
18. G	38. G	58. K
19. D	39. E	59. E
20. H	40. G	60. F

Reading Test

1. B	21. A
2. J	22. F
3. A	23. D
4. H	24. G
5. A	25. D
6. F	26. H
7. C	27. B
8. G	28. F
9. C	29. C
10. J	30. J
11. A	31. A
12. H	32. G
13. D	33. C
14. F	34. F
15. C	35. D
16. G	36. H
17. B	37. A
18. H	38. G
19. D	39. D
20. F	40. J

Science Reasoning Test

1. D	21. C
2. G	22. J
3. B	23. B
4. J	24. F
5. B	25. B
6. F	26. J
7. A	27. A
8. F	28. J
9. C	29. A
10. G	30. H
11. D	31. D
12. H	32. G
13. B	33. A
14. H	34. H
15. C	35. C
16. F	36. G
17. B	37. A
18. G	38. H
19. C	39. B
20. J	40. H