1 ■ ■ ■ ■ ■ ■ ■ ■ 1

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

> The following paragraphs may or may not be in the most logical order. You may be asked questions about the logical order of the paragraphs, as well as where to place sentences logically within any given paragraph.

Michigan's Mesmeric Stone

Some residents of Michigan would probably be surprised and shocked to learn that, during the Devonian
1
Age, 350 million years ago, this northern state was located near the earth's equator. At that time, Michigan was hidden underneath by a warm body of water. It was this
2
marine environment that eventually produced Michigan's unique rock formation known as the Petoskey stone.

The light brown Petoskey stone is easily distinguished from other stones having its pattern of numerous and
3
contiguous six-sided cells. These cells were once the living coral that was present during the Devonian Age, which slow became petrified into rock that was then gradually
4
carried north by the slow movement of glaciers. Petoskey stones can vary in appearance, largely due to the content of each coral cell. Most Petoskey stones contain high levels

1. **A.** NO CHANGE
   B. saddened
   C. surprised
   D. disappointed

2. **F.** NO CHANGE
   G. submerged and under
   H. hidden beneath
   J. completely and totally submerged by

3. **A.** NO CHANGE
   B. by
   C. because
   D. from

4. **F.** NO CHANGE
   G. as slow as
   H. slowly became
   J. slow to become

GO ON TO THE NEXT PAGE.

1 ■ ■ ■ ■ ■ ■ ■ ■ **1**

of calcite, but some also contain quartz, pyrite, silica, and
                       5
other minerals. Because of this variety in makeup,

polishing a Petoskey stone can either be a fairly simple

task or one that highly requires a high level of skill and
                     6
patience.

   [1] Some rock collectors might be fortunate to find a

Petoskey stone that has been naturally polished by

wind; sand; and water. [2] In many cases, though, the
       7
stones are not exposed to the elements, so some hard labor

might be necessary to produce a smooth, shiny surface that

displays the stones' unique pattern. [3] Despite this, the
                                          8
calcite contained in Petoskey stone is highly conducive to

hand polishing; it is soft enough to give way to sandpaper,
       9
yet strong enough to accept the polishing compound that is

usually applied once all the scratch marks have been

carefully sanded away. [4] It is important to take time to

remove all of the scratches, then they will be present in the
                                 10
finished stone along with the coral fossils. ⑪

   For the serious rock enthusiast, investing in an electric

rock tumbler is a good way to simplify the process of

rock-polishing. Simply place the collected rocks into the

paint-can sized canister, add polishing compound, and push

the button. This begins a long rotation process whereby the

stones are abraded until they have a smooth, glossy finish.
      12

5. Which choice would best help to establish that
Petoskey stones can vary from one another?
   A. NO CHANGE
   B. but contain some
   C. which predominantly possess
   D. and also include

6. **F.** NO CHANGE
   G. requires a level of high
   H. requires a high level
   J. required a high level

7. **A.** NO CHANGE
   B. wind and sand
   C. wind sand
   D. wind, sand,

8. **F.** NO CHANGE
   G. Fortunately,
   H. Still,
   J. Nevertheless,

9. **A.** NO CHANGE
   B. hand polishing, it
   C. hand polishing being it
   D. hand polishing it

10. **F.** NO CHANGE
   G. whereas
   H. otherwise
   J. and

11. For the sake of logic and coherence, Sentence 2 should
be placed:
   A. where it is now.
   B. before Sentence 1.
   C. after Sentence 3.
   D. after Sentence 4.

12. **F.** NO CHANGE
   G. stones' are
   H. stone's are
   J. stones, are

1 ■ ■ ■ ■ ■ ■ ■ ■ 1

One advantage of using a rock tumbler instead of hand polishing the stones <u>are that</u> the tumbler can do the work
13
while you scout for more stones to put in it!

Petoskey stones are often difficult to find, depending on the season of the year. Generally, early spring will bring in a new crop of stones after the ice has melted and the stones have been pushed to the shorelines of the northern Great Lakes. ⊡14 A good rain will highlight the Petoskey stone's coral pattern, making it easier to spot in the sand. Of course, you can always find Petoskey stones in tourist shops throughout the northern part of the state, but it is much more fun and satisfying to locate one yourself as you walk along the beautiful beaches of Michigan.

13. A. NO CHANGE
   B. is that
   C. can be
   D. is so

14. The writer is considering deleting the preceding sentence. If the sentence were deleted, the essay would primarily lose:
   F. the introduction to the essay.
   G. a summary of the preceding paragraph.
   H. an important detail supporting a main idea.
   J. the conclusion to the essay.

Question 15 asks about the preceding passage as a whole.

15. Suppose the writer had chosen to write an essay about living near the Great Lakes. Would this essay fulfill the writer's goal?
   A. Yes, because this essay refers to Michigan and the Great Lakes several times throughout the text.
   B. Yes, because the writer makes it clear that Petoskey stones are unique to that area of the country.
   C. No, because the writer discusses only the state of Michigan and not the Great Lakes in general.
   D. No, because the essay is primarily about the Petoskey stone and not about living near the Great Lakes.

GO ON TO THE NEXT PAGE.

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PASSAGE II

Summer Creatures

The day was hot and sultry, but the cool of the evening approaches as the sun hides itself behind the horizon. Each of us has pulled a lawn chair <u>onto</u> the expansive wooden
16

deck and <u>have settled in</u> for the show. No one says a word.
17
A slight rustling in the thicket of maidenhair ferns off in the distance <u>can resonate</u>; something is either bedding
18
down or emerging for an evening hunt. A similar sound is barely audible just in front of <u>us, and we</u> remain silent and
19
attentive.

Suddenly, loud clucking penetrates the silence,

<u>followed by</u> more feverish clucking and chirping, some of
20
it loud and commanding, some more soothing and calming. These are the sounds of wild turkey hens coming in to roost, <u>sounding off on</u> safety issues and weather
21
predictions. They cluck and rustle as they roam through the woods, final destination unknown. Here and there, a chickadee, finch, or red-headed woodpecker flies overhead toward a cozy nest. <u>The sky</u> darkens and the last diurnal
22
winged creature takes to its bed, the evening air begins

16. **F.** NO CHANGE
    G. over
    H. by
    J. upon

17. **A.** NO CHANGE
    B. settled in
    C. has settled in
    D. have been settled in

18. **F.** NO CHANGE
    G. resonated
    H. resonates
    J. can be resonating

19. Which of the following alternatives to the underlined portion would NOT be acceptable?
    A. us. We
    B. us—we
    C. us; we
    D. us we

20. **F.** NO CHANGE
    G. following by
    H. followed with
    J. following

21. At this point, the writer wants to liken the wild turkeys to people. Which choice would most effectively accomplish this purpose?
    A. NO CHANGE
    B. clucking and chirping over
    C. fluffing their feathers over
    D. making noise about

22. **F.** NO CHANGE
    G. (Do NOT begin a new paragraph) Which the sky
    H. (Begin a new paragraph) The sky
    J. (Begin a new paragraph) As the sky

GO ON TO THE NEXT PAGE.

1 ■ ■ ■ ■ ■ ■ ■ ■ **1**

to welcome its nocturnal flyers, namely fruit bats and night owls. The frenetic bats dart back and forth, high and low, as they began filling their bellies with mosquitoes and
23
other insects. Occasionally an owl will let out its soft "hoo-hoo." This single call is enough to please the small crowd on the deck.

We begin to hear more rustling that seems much louder than before. As the evening light darkens, the field creatures become braver and bolder, their vision becoming more acute as ours fades with the disappearing light.

It is almost completely dark now, aside from the massive blanket of stars that lingers over our heads. ☐24
It is dizzying to look up and focus on individual stars, and equally disabling to scan the entire sky and take it in all at once. We still say nothing, except for an occasional whisper of "Did you hear that?" or "Wow." The reverence is clear, the quiet awe palpable.

[1] Suddenly, we hear a single coyote howl way off in
25
the distance, low and slightly tentative, followed shortly
25
by another coyote baying, this time louder and more
25
insistent. [2] We had been told that coyotes live here, but
25
now we knew for sure. [3] The darkness falls all around us and the baying and howling grow louder. [4] Are the coyotes coming closer, or does sound become clearer as the night enfolds us? [5] It is difficult to know for sure: but each subsequent "oowww–ooooh" brings us
26

23. A. NO CHANGE
B. they have begun
C. they begin
D. they are beginning

24. Given that all of the following are true, which sentence, if added here, would provide the most effective support for the statements made regarding the night sky?
F. The moon is not out tonight, so the stars shine ever more brightly and the Milky Way appears ethereal and primordial.
G. The cloud cover overhead makes the night seem that much darker.
H. The night air is beginning to have the hint of a chill and we begin thinking about our warm blankets inside the cabin.
J. The clear sky finds it difficult to give way to the dark shadows of the night.

25. Given that all of the choices are true, which one would most effectively introduce the subject of this paragraph and maintain the tone of the essay?
A. NO CHANGE
B. Coyotes are rarely seen during the day as they prefer to do their hunting in the dark of the night.
C. The lights in the cabin seem to beckon to us.
D. Of all the sounds we hear, the howling of the coyote seems to be the most endearing.

26. F. NO CHANGE
G. sure but
H. sure; but
J. sure, but

1 ■ ■ ■ ■ ■ ■ ■ ■ 1

closer to moving inside the warm cabin. [27] We are

calm; but ready to give the night back to its rightful
<u>   </u>
28

owners. Our skin <u>has cooled</u> from the day's heat and we
                29

have had our bedtime story. Just as we sense that the time

has come to slip inside, the unmistakable flash of a

streaking meteor <u>is catching our eyes</u> and we jerk our
              30

heads upwards, just in time to see the shooting star fade

into the blackness. It is time to say goodnight.

PASSAGE III

> The following paragraphs may or may not be in the most
> logical order. You may be asked questions about the log-
> ical order of the paragraphs, as well as where to place
> sentences logically within any given paragraph.

Adventures in Australian English

  "Have a gander! Some mozzies landed in the barbie,

right on the chook! We'll have to get take-away!"

Translation: "Look! Some mosquitoes <u>have been landed</u> in
                               31

the barbecue, right on the chicken! We'll have to get

carry-out!"

  Such is the colorful lilt of Australian English, which is

as unique and distinctive as Australia itself. From

<u>Australia's beginnings</u> as an English penal colony in the
             32

late 1700s to its later incarnation as a land of opportunity,

the country continues <u>to be influenced by</u> outside forces,
                      33

which included the American military during World

War II. As a result, the Australian language is a rather

clever, often humorous blend of both British and American

27. Which of the following sentences in this paragraph is LEAST relevant to the main focus of the essay and, therefore, could be deleted?
- **A.** Sentence 1
- **B.** Sentence 2
- **C.** Sentence 3
- **D.** Sentence 4

28. **F.** NO CHANGE
- **G.** calm but
- **H.** calm, but
- **J.** calm. But

29. **A.** NO CHANGE
- **B.** has been cooled
- **C.** got cooled
- **D.** cooled

30. **F.** NO CHANGE
- **G.** caught our eyes
- **H.** catches our eye
- **J.** has caught our eyes

31. **A.** NO CHANGE
- **B.** had landed
- **C.** landed
- **D.** are landing

32. **F.** NO CHANGE
- **G.** Australia's first beginnings
- **H.** the first beginnings of Australia began
- **J.** Australia's first beginning

33. **A.** NO CHANGE
- **B.** by being influenced by
- **C.** the influence of
- **D.** to being influenced by

GO ON TO THE NEXT PAGE.

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versions of English. American television also played a major role in the Americanization of Australian English, often causing Australian's to replace British words with their American counterparts, such as the American word *truck* replacing the British word *lorry*.

   There are three main principal types of Australian English, although they overlap quite a bit. "General Australian English" is spoken by the majority of native Australians, and emphasizes shorter vowel sounds and have fewer variations in diction. "Broad Australian" is more prevalent outside of the island's major cities.

   The lesser common dialect of Australian English is the "cultivated" form, which is spoken by about 10 percent of the Australian population. Many Australians consider the cultivated form to be too haughty and snobbish.

Vast majority of Australians reject that particular variety.

   Australian English vocabulary also varies from one region to another. For example, in New South Wales, a bathing suit may be called a *swimmer* or a *tog*, while in other areas it is referred to as a *bather*. A ten-ounce drinking glass may be called a *pot*, *handle*, *middy*, *ten*, or *schooner*, depending on the region of the country. Additionally, the word *footy* can refer to Australian football or rugby.

   Australian English has other distinctive traits, such as a propensity toward more vivid expressions like *mangy maggot* or *bloody grub* used to signify unlikable people. Australians also frequently shorten English words, then

34. **F.** NO CHANGE
   G. Australians
   H. Australians'
   J. Australian

35. **A.** NO CHANGE
   B. and principal
   C. principally
   D. OMIT the underlined portion.

36. Which choice best gives the sense that "General Australian English" is the most prevalent form used in Australia?
   F. NO CHANGE
   G. people in Australia
   H. Australians
   J. those native to Australia

37. **A.** NO CHANGE
   B. but have
   C. so has
   D. and has

38. **F.** NO CHANGE
   G. least of all common
   H. less common
   J. least common

39. **A.** NO CHANGE
   B. to
   C. so
   D. far to

40. **F.** NO CHANGE
   G. Vast majority of English Australians
   H. The vast majority of Australians
   J. Majority of the Australians

41. **A.** NO CHANGE
   B. The word *footy*, additionally, can refer
   C. Referring to the word *footy* can additionally refer
   D. Additionally, in reference to the word *footy*, it refers

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add an "o" or "ie" to the end, thus producing a diminutive form. 42 Examples are *servo*, which means service station, and *ambo*, which means ambulance or the person who drives one.

[1] In 1981, the Macquarie Dictionary of Australian

English had been published by Macquarie Library Pty, Ltd., in association with the Linguistics Department of Macquarie University in Sydney. [2] Subsequent editions have included encyclopedic entries and more extensive word and phrase origins. [3] Over time, Australian schools, businesses, and legal systems have adopted the Macquarie Dictionary, although it is difficult to keep up with the country's ever-changing adaptations caused by outside (particularly American) influences. [4] As some Australians would say, the Macquarie Dictionary has *Buckley's* of keeping up with modern times! 44

42. If the writer were to delete the phrase "adding an 'o' or 'ie' to the end" (ending the sentence with the word *form*), the essay would primarily lose a detail that:
   F. is necessary in order to understand the beginning of the sentence.
   G. gives an example of the humor that is often associated with Australian English.
   H. contradicts the references to the Americanization of Australian English.
   J. is necessary to explain the examples that are given in the next sentence.

43. A. NO CHANGE
   B. was published
   C. were published
   D. is published

44. Which of the following sequences of sentences makes this paragraph most logical?
   F. NO CHANGE
   G. 1, 3, 2, 4
   H. 1, 2, 4, 3
   J. 1, 4, 2, 3

Question 45 asks about the preceding passage as a whole.

45. Suppose the writer had intended to write a travel magazine article that would prepare a visitor for a trip to Australia. Would this essay successfully fulfill this goal?
   A. Yes, because the essay describes the nuances of Australian English, which is the main language spoken in Australia.
   B. Yes, because the writer gives specific examples of word usage and vocabulary commonly used in Australia.
   C. No, because the essay only addresses the language used in Australia and does not mention other aspects of the country and its people.
   D. No, because the essay mainly discusses Australia from an historical perspective.

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> The following paragraphs may or may not be in the most logical order. You may be asked questions about the logical order of the paragraphs, as well as where to place sentences logically within any given paragraph.

"Eye" Can See You!

Imagine, if you can, sticking a clear, semi-rigid dime into each of your eyes. As a ninth-grader in the early 60s,
46

that's what I felt I will be doing with my first pair of
47
contact lenses. In those days, wearing contact lenses

was, truly a novelty. "Hard lenses," as they are called, is
48
an apt description of those things, and equally so of the

frustration they cause in the pursuit of clear vision.

I was diagnosed in third grade as being near-sighted
49
and astigmatic. My teacher had noticed that something was
49
wrong because I stood about a foot away from a classroom

projection screen in order to read the captions on the

science slides. In those days, we learned through a
50
sequence of picture slides the teacher would narrate, kind

of like a rudimentary computer presentation. While most
51
students thrilled to see the teacher dim the lights and fire

up the projector, I was sunk in my seat to avoid her
52
attention once the time inevitably came to read aloud the

fine print so fuzzy in the distance.

[1] When I was finally fitted with my first glasses at age

eight, I remember thinking how cheated I had been in my

young life; I had no idea that most people could see as

clearly as I began to that day! [2] It was dizzying walking

out of the optometrist's office. [3] Objects were suddenly

46. F. NO CHANGE
   G. both of
   H. two of
   J. OMIT the underlined portion

47. A. NO CHANGE
   B. was doing
   C. had done
   D. would do

48. F. NO CHANGE
   G. was truly, a novelty
   H. was truly a novelty
   J. was, truly a, novelty

49. A. NO CHANGE
   B. as near-sighted in the third grade and diagnosed with astigmatism
   C. diagnosed in the third grade with an astigmatism and also nearsightedness
   D. near-sighted as a diagnosis, with astigmatism

50. F. NO CHANGE
   G. learn
   H. we have learned
   J. we were learning

51. Which of the alternatives would be LEAST appropriate and relevant to the essay?
   A. NO CHANGE
   B. primitive
   C. simple
   D. complicated

52. F. NO CHANGE
   G. had sunk
   H. had sank
   J. sank

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more rigid and linear; colors seemed more intense and striking. [4] For eight years, everything around me had been one big blur and I hadn't a clue! [5] I felt so alive! [6] My eyeglasses became a sort of lifeline, the first thing I put on and the last thing I took off every day. [53]

Although they represent a less dramatic change, my first contact lenses six years <u>later at</u> once again sharpened my
54
focus and heightened my senses. Wearing contact lenses, however, took some adjustment; several weeks were required to build calluses on the underside of each eyelid. Putting those saucers in each eye also proved a challenge. <u>Regardless,</u> the old lenses were much thicker than today's
55
contact lenses.

While applying the lenses to each eye was difficult, <u>they were easy to pop out</u>, especially when you least
56
expected them to. There is nothing like fishing a contact lens out of a toilet bowl <u>or</u> gingerly using the stopper to
57
retrieve a lens from the wall of the bathroom sink drain. I probably lost and found at least a dozen lenses in the first two years of wearing them. Since I was virtually blind without my contacts, my immediate reaction was always to cry out for help in locating the missing lens.

I can still remember one day sitting in the back row in algebra class surrounded by several classmates. I glanced up quickly at the teacher when, in a flash, out came a lens. I could sense it falling to the tile <u>floor certainly</u> in the path
58
of some kid's foot. I tried working my way to the floor

53. Which of the following sequences of sentences makes this paragraph most logical?
A. NO CHANGE
B. 1, 3, 2, 4, 5, 6
C. 2, 3, 4, 1, 5, 6
D. 1, 4, 2, 3, 5, 6

54. **F.** NO CHANGE
G. later than
H. later
J. OMIT the underlined portion

55. **A.** NO CHANGE
B. Again,
C. Unfortunately,
D. However,

56. **F.** NO CHANGE
G. those lenses were easy to pop out
H. they popped out easily
J. the lenses also popped out easily

57. **A.** NO CHANGE
B. while
C. whereas
D. and

58. **F.** NO CHANGE
G. floor, certainly
H. floor; certainly
J. floor, but certainly

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as discreetly as possible, <u>palms down</u>. Suddenly, my
₅₉
chair's metal legs slipped a few inches on the waxy floor

and I landed right on top of my precious lens with a thud,

crushing it to oblivion. I had gotten my new contacts only

three days earlier. How would I explain this to my mother?

She had already questioned my maturity for months before

buying me this latest pair. ▢60

59. Given that all of the choices are true, which one would
best conclude the sentence while providing the reader
with the most vivid image of how the writer searched
for his lost contact lens?
A. NO CHANGE
B. moving towards where I thought the last contact
would be.
C. without anyone noticing.
D. patting the linoleum in wide sweeps.

60. At this point, the writer is considering adding the
following sentence:

> In the end, my mother understood the delicate
> nature of wearing contact lenses, and within days
> I was again able to see clearly with my new lenses.

Should the writer make this addition here?
F. Yes, because it tells the reader the real reason why
the author is upset about breaking her contact lens.
G. Yes, because it effectively concludes the essay
while maintaining the tone of the essay.
H. No, because the author explains throughout the
essay that she preferred wearing eyeglasses.
J. No, because the author is not really near-sighted.

PASSAGE V

> The following paragraphs may or may not be in the most
> logical order. You may be asked questions about the log-
> ical order of the paragraphs, as well as where to place
> sentences logically within any given paragraph.

Graphic Artists: Art Meets Technology

[1]

 "Many graphic artists who obtained their training 15 to

20 years ago will have a problem finding work if they

haven't learned to use computer software to create their

<u>art."</u> declares Sue Mauro, publicist for a U.S. hotel chain.
₆₁

<u>In fact, successful businesses often rely on the creativity</u>
₆₂
<u>and talent of graphic artists to create and produce</u>
₆₂
<u>images and text in the form of digital media,</u>
₆₂
<u>print, films, packaging, and signage.</u>
₆₂

61. A. NO CHANGE
B. art,"
C. art"
D. art!"

62. Given that all of the choices are true, which one would
provide the most detailed and relevant information at
this point in the essay?
 F. NO CHANGE
G. Many young people are seeking degrees in the field
of graphic arts.
H. Finding a college that offers a strong graphic arts
program can often be a challenge.
 J. The field of graphic arts has changed considerably
due to advanced technology.

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[2]

Mauro's comment <u>was also</u> applicable to the creation
    63
of animated films.

[64] Flip-books are a perfect basic example of early
animation; each drawing in the book has a slight
variation from the preceding drawing. When the pages

are flipped in rapid <u>succession; an</u> action scene unfolds
      65
over a few seconds. Traditional animated films are

based on this same principle, <u>although</u> their production
       66
is much more complicated and time-consuming. In

traditional film animation, several drawings are

meticulously applied to <u>cels. Sheets</u> of clear plastic.
       67

<u>As a result,</u> the entire series of cels is photographed in
  68
succession, creating a long, moving cartoon story.

Layering cels allows objects that remain stationary to

reappear so that only the moving parts must be redrawn.

[3]

[1] This old way of creating <u>animated moving</u> films is
         69
known as traditional ink-and-paint and has given way to

today's digital ink-and-paint. [2] In the digital

ink-and-paint process, the hand drawings are scanned and

digitized. [3] <u>The rest of the production of the film takes</u>
         70
<u>place through the use of the computer rather than being</u>
         70
<u>applied to individual cels.</u> [4] This method has greatly
    70

63. A. NO CHANGE
 B. is to be
 C. was
 D. is also

64. Which of the following sentences would most effec-
tively introduce the subject of this paragraph and act
as a transition from the preceding paragraph?
 F. Film animation began as a series of pictures that
simulated motion when shown together rapidly.
 G. Flip-books were a popular 'toy' in the 1950s.
 H. Some graphic artists have no interest in creating
motion pictures and are focusing instead on print
media, such as that used in advertising.
 J. Film animation has changed dramatically over the
past several decades.

65. A. NO CHANGE
 B. succession an
 C. succession-an
 D. succession, an

66. F. NO CHANGE
 G. therefore
 H. because
 J. and in contrast

67. A. NO CHANGE
 B. cels; or sheets
 C. cels, or sheets
 D. cels, which like sheets

68. F. NO CHANGE
 G. Consequently,
 H. Therefore,
 J. Eventually,

69. A. NO CHANGE
 B. animated
 C. animatedly moving
 D. animated and moving

70. F. NO CHANGE
 G. The rest of the balance of the production takes
place by using the computer instead of applying
the artwork to the cels.
 H. The balance of the production is done through the
use of computer software instead of using acetate
cels.
 J. The film is then produced using a computer rather
than the plastic cels.

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decreased the amount and length of time that it takes to
71

create a whole film, and has allowed animators, from
72

all over the world, to contribute to a single film's
72

production. [5] With more advanced technologies,

animators can even draw their original pictures on a

graphics tablet that enters the data directly into a computer.

[6] Once the outline of the drawing is complete, it is rather

simple to add color. [7] In addition, it is easier to make

changes than it is with traditional ink-and-paint. [8] Digital

animation also produces an entirely different look to the

finished product, and graphic art has always depended on
73

fresh, new looks to grab viewers' attention. 74

[4]

Though some graphic artists resist change, those who

delve into this new technological world often find a way to

become comfortable with the marriage of art and

technology. The bottom line is that working with

technology may be the only way to remain in their chosen

field.

71. A. NO CHANGE
   B. length of time, as well as the amount,
   C. length and amount and time
   D. time

72. F. NO CHANGE
   G. animators from all over the world,
   H. animators, from all over the world
   J. animators from all over the world

73. Which of the following alternatives to the underlined portion would NOT be acceptable?
   A. product—graphic art
   B. product; graphic art
   C. product, graphic art
   D. product. Graphic art

74. For the sake of the logic and coherence of this paragraph, Sentence 5 should be placed:
   F. where it is now.
   G. before Sentence 3.
   H. before Sentence 4.
   J. after Sentence 7.

Question 75 asks about the preceding passage as a whole.

75. The writer wishes to add the following sentence in order to emphasize the influence of technology in jobs related to graphic arts:

   Most graphic artists start out as traditional artists, and many are discovering that their natural talent is no longer enough to survive in this highly competitive field.

   The new sentence would best support and be placed at the beginning of Paragraph:
   A. 1
   B. 2
   C. 3
   D. 4

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.

1. Which of the following lists all the positive factors of 32?
   A. 1, 32
   B. 2, 16
   C. 2, 4, 8, 16
   D. 2, 4, 8, 16, 32
   E. 1, 2, 4, 8, 16, 32

2. All CDs are equally priced. If 8 CDs cost $76.00, what is the cost of 1 CD?
   F. $0.10
   G. $2.05
   H. $7.60
   J. $9.50
   K. $10.50

3. $2x^2 \times 3x^2y^2 \times 5x^2y$ is equivalent to:
   A. $30x^8y^3$
   B. $30x^8y^2$
   C. $30x^6y^3$
   D. $11x^8y^3$
   E. $11x^6y^2$

4. What is the value of the expression $10(100x - 10{,}000) + 100$ when $x = 250$?
   F. 2,500
   G. 150,100
   H. 160,000
   J. 210,000
   K. 300,100

5. $4a^3 \times 5a^8 = ?$
   A. $9a^5$
   B. $9a^{11}$
   C. $9a^{24}$
   D. $20a^{11}$
   E. $20a^{24}$
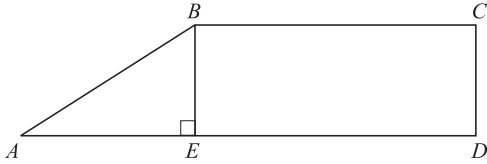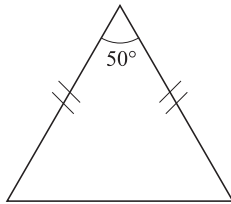
DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

6. In the figure shown below, $AD = 16$, $ED = 11$, and AE is congruent to CD. What is the length of AB?

   F. 5
   G. $5\sqrt{2}$
   H. 6
   J. $11\sqrt{2}$
   K. 25

7. Which of the following numbers is the least in value?
   A. 0.02×10^4
   B. 0.2×10^3
   C. 2.0×10^{-2}
   D. 20.0×10^2
   E. 0.002×10^5

8. The isosceles triangle below has one angle measure as shown. What is the measure of each of the other angles?

   F. 30°
   G. 45°
   H. 50°
   J. 65°
   K. 130°

9. The sum of the real numbers a and b is 13. Their difference is 5. What is the value of ab?
   A. 5
   B. 8
   C. 18
   D. 36
   E. 65

10. 37 is what percent of 144, to the nearest percent?
   F. 26%
   G. 37%
   H. 44%
   J. 74%
   K. 107%

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**
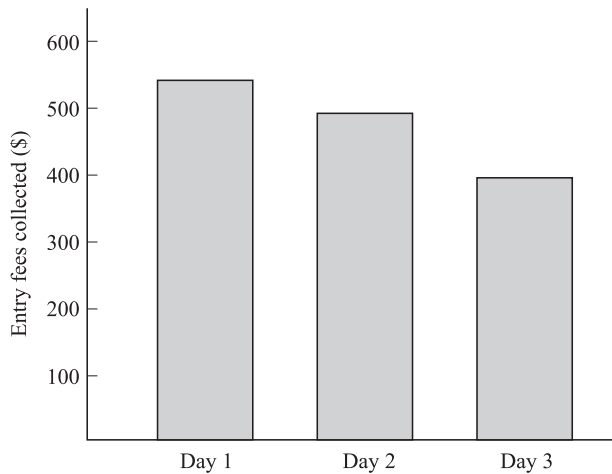
> Use the following information to answer Questions 11–12.

The Moondance Riding Academy held its annual horse show for 3 days. The total amount collected in entry fees for the 3 days was $1,450. The amount collected, in dollars, is shown for each of the 3 days in the bar graph below:

DO YOUR FIGURING HERE.

11. Approximately what percent of the money collected from entry fees over the 3 days was collected on Day 2?
A. 29%
B. 34%
C. 38%
D. 66%
E. 90%

12. The mean amount collected per day during the 3-day period is what, to the nearest dollar?
F. $300
G. $483
H. $577
J. $1,450
K. $4,350

13. For all n, $(3n + 5)^2 = ?$
A. $6n^2 + 15n + 10$
B. $6n^2 + 30n + 25$
C. $9n^2 + 6n + 10$
D. $9n^2 + 15n + 25$
E. $9n^2 + 30n + 25$

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

14. A certain brand of cereal costs \$3.25 per box before sales tax is added. When you buy 5 or more boxes of this cereal you receive 1 additional box for free. What is the average cost per box of cereal for 6 boxes before sales tax is added?

  F. \$2.17
  G. \$2.71
  H. \$2.80
  J. \$3.25
  K. \$3.79

15. Rana and Tom own a pizza shop, which offers 3 kinds of cheese, 4 kinds of meat toppings, and 5 kinds of vegetable toppings. Each type of pizza on the menu has a combination of exactly 3 ingredients: 1 cheese, 1 meat, and 1 vegetable. How many types of pizzas are possible?

  A. 12
  B. 24
  C. 36
  D. 50
  E. 60

16. On the real number line, what is the midpoint of -3 and 11?

  F. -5
  G. 0
  H. 4
  J. 7
  K. 14

17. Which real number satisfies $(2^n)(8) = 16^3$?

  A. 3
  B. 4
  C. 6
  D. 9
  E. 12

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

  F. -56
  G. -40
  H. 8
  J. 24
  K. 40

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

19. A clock tower casts a 150-foot shadow on level ground, as shown below. The angle of elevation from the tip of the shadow to the top of the tower is 40°. To the nearest tenth of a foot, what is the height of the clock tower?

150 feet
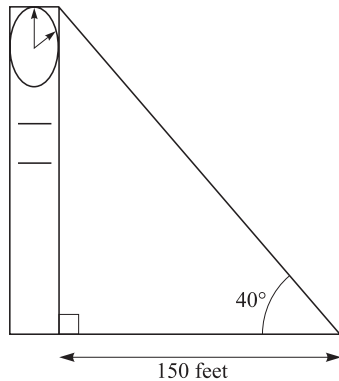
(Note: $\cos 40° = \sin 50° \approx 0.77$

$\cos 50° = \sin 40° \approx 0.64$

$\tan 50° \approx 1.19$

$\tan 40° \approx 0.84$)

A. 194.8
B. 178.5
C. 150.0
D. 126.0
E. 115.5

20. If $4(x - 2) + 5x = 3(x + 3) - 11$, then $x = $?
   F. -3
   G. -1
   H. 0
   J. 1
   K. 2

21. What is the least common multiple of 40, 70, and 60?
   A. 240
   B. 420
   C. 840
   D. 1,680
   E. 168,000

22. If $4\frac{2}{5} = a - 1\frac{2}{3}$, then $a = $?

   F. $\frac{95}{15}$

   G. $\frac{91}{15}$

   H. $\frac{41}{15}$

   J. $\frac{27}{8}$

   K. $\frac{17}{8}$

**GO ON TO THE NEXT PAGE.**

2 △ △ △ △ △ △ △ △ **2**

23. A system of linear equations is shown below.

$$4y - 2x = 8$$

$$4y + 2x = 8$$

Which of the following describes the graph of this system of linear equations in the standard (x, y) coordinate plane?
A. A single line with positive slope
B. A single line with negative slope
C. Two distinct intersecting lines
D. Two parallel lines with positive slope
E. Two parallel lines with negative slope

24. A house painter charges $24.00 per hour for a painting job that requires more than 5 hours to complete. For any job requiring 5 hours or less, the house painter charges a flat fee of $100. If n represents the number of hours the job requires, which of the following expressions gives the charge, in dollars, for a job requiring more than 5 hours to complete?
 F. 124.0
G. $-24n + 100$
H. $24n - 100$
 J. $24n$
K. $24n + 100$

25. The average (arithmetic mean) 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
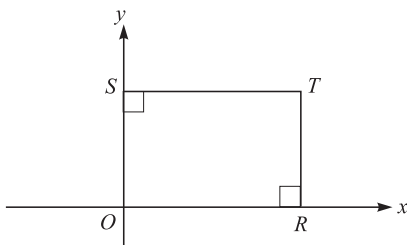
26. In the figure above, $OS = ST$ and the coordinates of T are $(k,5)$. What is the value of k?
 F. -5
G. -3
H. -2
 J. 0
K. 5

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

**27.** At a summer camp, one boy and one girl will be selected to lead the weekly activities. If there are 130 boys and 145 girls at the camp, how many different 2-person combinations of 1 boy and 1 girl are possible?
  A. 15
  B. 275
  C. 550
  D. 9,425
  E. 18,850

28. If 3 times a number x is added to 12, the result is negative. Which of the following gives the possible value(s) for x?
  F. All $x > 4$
  G. All $x < -4$
  H. 36 only
  J. 4 only
  K. 0 only

29. The figure below shows 2 tangent circles such that the 9-inch diameter of the smaller circle is equal to the radius of the larger circle. What is the approximate area, in square inches, of the shaded region?
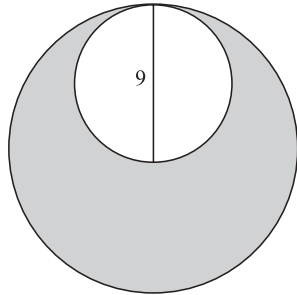
  A. 28.27
  B. 56.55
  C. 63.62
  D. 190.74
  E. 254.47

30. $(x^3 + 2x^2 + 3x - 2) - (2x^3 - x^2 - 4)$ is equivalent to:
  F. $-x^3 + x^2 + 3x - 6$
  G. $-x^3 + 3x^2 + 3x + 2$
  H. $2x^3 - 2x^2 + 3x - 2$
  J. $2x^6 + x^4 + 3x - 6$
  K. $2x^6 + 3x^4 + 3x + 2$

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

x	0	1	2	3
$f(x)$	-6	-5	-2	3

DO YOUR FIGURING HERE.

31. The table above gives values of the quadratic function f for selected values of x. Which of the following defines the quadratic function f?

A. $f(x) = x^2 - 6$
B. $f(x) = x^2 + 6$
C. $f(x) = 2x^2 - 10$
D. $f(x) = 2x^2 - 6$
E. $f(x) = 2x^2 - 7$

32. What is the median of the following 6 test scores?

   64, 72, 85, 80, 72, 89

F. 64
G. 72
H. 76
J. 77
K. 82.5

33. For all numbers x and y, let the operation ¤ be defined as $x \text{ ¤ } y = 2xy - 4x$. If a and b are positive integers, which of the following can be equal to zero?

   I. $a \text{ ¤ } b$
   II. $(a - b) \text{ ¤ } b$
   III. $b \text{ ¤ } (a - b)$

A. I only
B. II only
C. III only
D. I and II only
E. I, II, and III

34. In the figure shown below, the measure of $\angle SRT$ is $(x + 15)°$ and the measure of $\angle SRU$ is $90°$. What is the measure of $\angle TRU$?
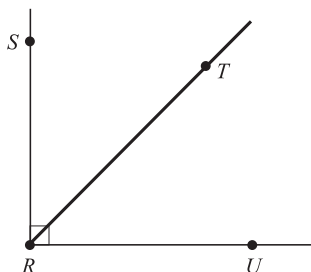
F. $(105 + x)°$
G. $(105 - x)°$
H. $(75 + x)°$
J. $(75 - x)°$
K. $(x - 75)°$

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

35. $(6a - 12) - (4a + 4) = ?$
 A. $2(a + 2)$
 B. $2(a + 4)$
 C. $2(a - 2)$
 D. $2(a - 4)$
 E. $2(a - 8)$

36. In the standard (x, y) coordinate plane below, the points (0,2), (8,2), (3,6), and (11,6) are the vertices of a parallelogram. What is the area, in square units, of the parallelogram?
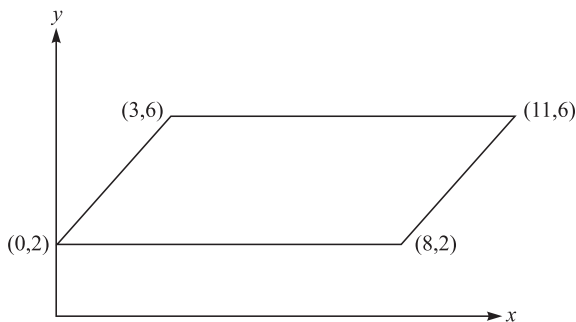
 F. $6\sqrt{2}$
 G. 16
 H. 32
 J. 56
 K. 88

37. Which of the following equations expresses z in terms of x for all real numbers x, y, and z, such that $x^5 = y$ and $y^3 = z$?
 A. $z = x$
 B. $z = \dfrac{3}{5}x$
 C. $z = 3x^5$
 D. $z = x^8$
 E. $z = x^{15}$

38. Which of the following statements is NOT true about the geometric sequence 36, 18, 9, …?
 F. The fourth term is 4.5.
 G. The sum of the first five terms is 69.75.
 H. Each consecutive term is $\dfrac{1}{2}$ of the previous term.
 J. Each consecutive term is evenly divisible by 3.
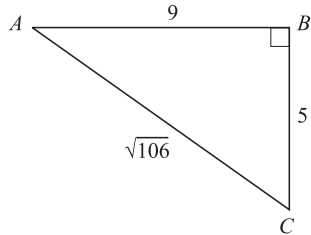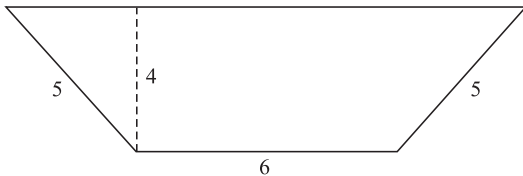 K. The common ratio of consecutive terms is 2:1.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

39. For right triangle *ABC* with dimensions in centimeters as given below, what is tan *C*?

A. $\dfrac{5}{9}$

B. $\dfrac{5}{\sqrt{106}}$

C. $\dfrac{9}{\sqrt{106}}$

D. $\dfrac{\sqrt{106}}{9}$

E. $\dfrac{9}{5}$

40. The area of a trapezoid is found by using the equation $\dfrac{1}{2}h(b_1+b_2)$, where *h* is the height and b_1 and b_2 are the lengths of the bases. What is the area of the trapezoid shown below?

F. 18
G. 20
H. 24
J. 30
K. 36

41. The diagonal of a rectangular garden is 15 feet, and one side is 9 feet. What is the perimeter of the garden?
A. 135
B. 108
C. 68
D. 48
E. 42

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

42. $\left(\frac{1}{3}a - b\right)^2 = ?$

  F. $\frac{1}{9}a^2 + b^2$

  G. $\frac{1}{9}a^2 - \frac{2}{3}ab + b^2$

  H. $\frac{1}{3}a^2 - \frac{2}{3}ab + b^2$

  J. $a^2 + b^2$

  K. $a^2 - \frac{1}{3}ab + b^2$

43. Which of the following inequalities defines the solution set for the inequality $23 - 6x \geq 5$?
  A. $x \geq -3$
  B. $x \geq 3$
  C. $x \geq 6$
  D. $x \leq 3$
  E. $x \leq -6$

44. What is the approximate distance between the points $(4, -3)$ and $(-6, 5)$ in the standard (x, y) coordinate plane?
  F. 8.92
  G. 12.81
  H. 16.97
  J. 17.95
  K. 19.22

45. The ratio of x to z is 3 to 5, and the ratio of y to z is 1 to 5. What is the ratio of x to y?
  A. 5:3
  B. 5:1
  C. 3:1
  D. 1:3
  E. 1:1

46. If $\tan \alpha = \frac{x}{y}$, $x > 0$, $y > 0$, and $0 < \alpha < \frac{\pi}{2}$, then what is $\cos \alpha$?

  F. $\frac{\sqrt{x^2 + y^2}}{y}$

  G. $\frac{y}{\sqrt{x^2 + y^2}}$

  H. $\frac{x}{\sqrt{x^2 + y^2}}$

  J. $\frac{y}{x}$
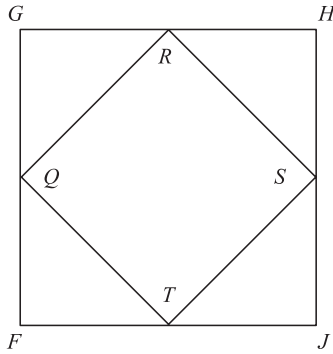
  K. $\frac{x}{y}$
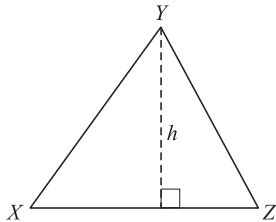
2 △ △ △ △ △ △ △ △ **2**

47. In the figure below, *FGHJ* is a square and *Q*, *R*, *S*, and *T* are the midpoints of its sides. If $\overline{GH}$ = 10 inches, what is the area of *QRST*, in inches?

A. 100
B. 50
C. 25
D. 20
E. $5\sqrt{2}$

48. In △ *XYZ* below, $\overline{XZ}$ is $\dfrac{7}{8}$ of *h*, the length of the altitude. What is the area of △ *XYZ* in terms of *h*?

F. $\dfrac{7h}{8}$

G. $\dfrac{7h^2}{8}$

H. $\dfrac{7h}{16}$

J. $\dfrac{7h^2}{16}$

K. $\dfrac{7h^2}{12}$

49. On Friday, a computer was priced at $800. On the following Wednesday, the price was reduced by 15%. On the following Friday, the price was further reduced by 20%. What percent of the original price was the final price?
A. 82.5
B. 68
C. 65
D. 35
E. 32

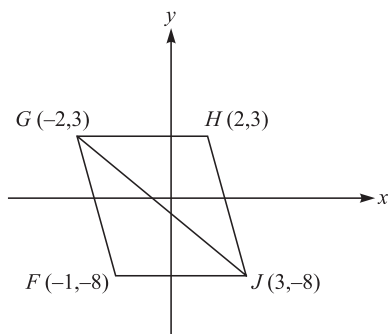**GO ON TO THE NEXT PAGE.**

2 △　△　△　△　△　△　△　△ **2**

50. If $ghjk = 24$ and $ghkl = 0$, which of the following must be true?

  F. $g > 0$
  G. $h > 0$
  H. $j = 0$
  J. $k = 0$
  K. $l = 0$

51. Given the vertices of parallelogram *FGHJ* in the standard (x, y) coordinate plane below, what is the area of triangle *GHJ*, in square units?

G (–2,3)　　　　H (2,3)

F (–1,–8)　　　J (3,–8)

  A. 11
  B. 15
  C. 22
  D. 44
  E. 88

52. If *X*, *Y*, and *Z* are real numbers, and $XYZ = 1$, then which of the following conditions must be true?

  F. $XZ = \dfrac{1}{Y}$
  G. *X*, *Y*, and $Z > 0$
  H. Either $X = 1$, $Y = 1$, or $Z = 1$
  J. Either $X = 0$, $Y = 0$, or $Z = 0$
  K. Either $X < 1$, $Y < 1$, or $Z < 1$

53. In the standard (x,y) coordinate plane, the *y*-intercept of the line $6x + 2y = 14$ is?

  A. -6
  B. -3
  C. 2
  D. 7
  E. 14

54. The average of a set of six integers is 38. When a seventh number is included in the set, the average of the set increases to 47. What is the seventh number?

  F. 38
  G. 47
  H. 101
  J. 228
  K. 329

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △ △ △ △ △ △ △ △ **2**

55. The area of a rectangular kitchen is 80 square feet. If the length of the floor is 4 feet less than four times the width, what is the width of the floor in feet?

   A. 4
   B. 5
   C. 8
   D. 16
   E. 17

56. For every cent increase in price of a pound of apples, the grocery store sells 25 fewer pounds per day. The grocery store normally sells 800 pounds of apples per day at $1.09 per pound. Which of the following expressions represents the number of pounds of apples sold per day if the cost is increased by $3x$ cents per pound of apples?

   F. $(1.09 + 3x)(800 - 75x)$
   G. $800 - 25x$
   H. $800 - 75(1.09)x$
   J. $800 + 75x$
   K. $800 - 75x$

57. Jason has been hired to build a circular wading pool in his neighbor's backyard. The rectangular backyard measures 60 feet wide by 50 feet long. Jason's neighbors want the pool to be as large as possible, with the edge of the pool at least 8 feet from the edge of the backyard all around. How long should the radius of the pool be, in feet?

   A. 8
   B. 17
   C. 22
   D. 34
   E. 44

58. If $f(x) = x^2 + 3$, then $f(x + y) = $?

   F. $x^2 + 2xy + y^2 + 3$
   G. $x^2 + 2xy + y^2$
   H. $x^2 + 2xy + 3$
   J. $x^2 + 3 + y$
   K. $x^2 + y^2$

DO YOUR FIGURING HERE.

GO ON TO THE NEXT PAGE.

2 △   △   △   △   △   △   △   △ 2

DO YOUR FIGURING HERE.

59. In a game, 84 marbles numbered 00 through 83 are placed in a box. A player draws 1 marble at random from the box. Without replacing the first marble, the player draws a second marble at random. If both marbles drawn have the same tens digit (that is, both marbles are numbered between 00 and 09, or 10 and 19, or 20 and 29, etc.), the player is a winner. If the first marble Dave draws is numbered 23, what is the probability that Dave will be a winner on the next draw?

  A. $\dfrac{9}{84}$

  B. $\dfrac{74}{83}$

  C. $\dfrac{9}{83}$

  D. $\dfrac{75}{84}$

  E. $\dfrac{10}{83}$

60. What is the smallest possible value for the product of 2 real numbers that differ by 6?
  F. -9
  G. -8
  H. -5
  J. 0
  K. 7

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

3   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: *The Lessons of Wilderness Living*

Members of modern society are fortunate to enjoy many conveniences once unheard of or reserved for the elite. Imagine, if you can, only one day without running water. It strains the mind to think of all the daily rituals
5   one would have to change if the tap suddenly went dry. People today take electricity for granted, too. Lately, I've realized that while reliance on modern technology can improve the efficiency and quality of life, it also keeps people from learning meaningful lessons
10 about living with the earth. The conservation ethics that I gained this summer while working at a hunting lodge I could not have learned elsewhere.

The lodge is located on a massive, little known lake in northern Canada, closer to the Arctic Circle than
15 it is to the U.S. border. Every spring, the lodge reopens to welcome scores of dedicated anglers itching to dip a line in the nearby pristine creeks. By summer, the small lodge fills to capacity with eager hunters. On the guided treks, these men and women primarily chase
20 migratory birds and caribou, but I have seen plenty of other unique game come back to the lodge kitchen for preparation. Every hunter agrees that what one finds at the lodge is a truly luxurious hunting experience. Many people are surprised to find the lodge is totally
25 self-sufficient, with the exception of the food staples it receives by small airplane. For a whole season, I was "off the grid," totally dependent on the lodge to provide me with heat, light, water, and sanitation.

When I asked the owner why he built his
30 modern-looking log lodge so far beyond the reach of civilization, he replied, "I didn't really like hunting anywhere the sewer line ran." *Or electricity or telephone or the water main*, I thought to myself. The boss is a peculiar man, but I see why he had no reservations
35 about setting up shop so deep in the wilderness. He had learned to love it years ago when he was an elite mountain soldier in the army. He always mentioned that life wasn't as difficult in the sub-arctic wilderness as people think. Of course, he had a lodge to run, and
40 not everyone was as hardy as he. His creative solutions to the lack of infrastructure are impressive.

The first necessity of employees and guests is clean water for cooking, eating, and washing. A nearby creek feeds a large pump that draws the water through a
45 particulate filter and into a large holding tank. A much smaller pipe takes some of this water through a series of purification devices. Inside, every sink has three taps: two blue and one red. Guests are used to the blue ones, drinkable hot and cold water, but the red one
50 always requires an explanation. My contribution over the summer was to design a sign for each sink explaining the ways one could use the unpurified water from the red tap that came directly from the holding tank. Showering and cleaning are the most important uses,
55 but "red" water is also useful for the garden or to give to the dogs.

The roof of the lodge is layered with solar cells to take advantage of the bright, clear summer sky. On average, the 10-room lodge can generate the
60 same amount of power as a conventional two-bedroom apartment uses. Naturally, this poses challenges. The biggest conservation measure I could see was total lack of electronics, with the exception of the computer in the back office, which I've never seen turned on. The
65 ceiling of every room has a large skylight, eliminating the need for electric light during the day. At night, a limited set of high-efficiency fluorescent bulbs illuminates the corridors and public spaces. Staff is equipped with flashlights for use in closets, outside, or in other
70 unlit spaces. Interestingly, the low lighting seems to foster an "early to bed, early to rise" mentality among the guests, who always rave about how rested they feel after a week's stay.

Guests and staff alike stay warm with heavy
75 woolen blankets, or, as my boss once quipped, "personal insulating devices." A full-circle fireplace in the center heats the main space. Smoke floats up the chimney while the heavy stainless steel hood reflects heat to all corners of the room. When guests close their
80 room doors at night, they can barely hear the high-speed electric impellers that draw warmth from the fire into the rooms.

The lodge is a model of efficiency in an often-unforgiving territory. My summer there taught me to
85 budget more carefully my consumption of water and power. It is such discipline that will be necessary in the future when costs of these commodities might be so high that civilization can no longer take their abundance for granted.

GO ON TO THE NEXT PAGE.

3 ██ **3**

1. Which of the following disadvantages of modern utilities is best supported by the details in the passage?
   A. Public water and electricity are currently very expensive.
   B. Utility commodities might eventually run out.
   C. Public utility lines reinforce the divide between densely populated cities and sparse wilderness.
   D. Municipal water and electricity are taken for granted, so most people never learn to live without them.

2. One can reasonably infer from the passage that a person who were to drink from a red tap would most likely:
   F. prefer cooler water.
   G. have to become accustomed to water with added chlorine or fluoride.
   H. be disappointed by the low pressure.
   J. risk falling ill from waterborne pathogens.

3. Given the way he is presented in the passage, the boss of the lodge can best be described as:
   A. sheltered and timid.
   B. vain and insincere.
   C. eccentric and enterprising.
   D. brash and calculating

4. The narrator's comment about "luxurious" hunts (lines 22–23) refers to trips that:
   F. provide amenities such as gourmet food.
   G. are all-inclusive, where no one need bring personal equipment.
   H. expose hunters to an unusual variety of game.
   J. educate guests on arctic ecology as they hunt.

5. The second and third paragraphs suggest that, if not for the need to host a variety of guests, the boss would prefer:
   A. a lodge closer to city services.
   B. a more modest lodge with fewer creature comforts.
   C. a large hunting estate with modern improvements.
   D. a wilderness skills training facility.

6. Which of the following conclusions about the relationship between the narrator and the boss is best supported by the details in the passage?
   F. The narrator does not fully grasp the boss's rationale for having such an isolated lodge, but admires his ingenuity nonetheless.
   G. The boss largely ignores the narrator and the rest of the workforce, focusing instead on the guests, but the narrator does not resent him for it.
   H. The boss is very shy and the narrator obliges him with privacy.
   J. The narrator is an inquisitive person whose frequent questions irritate the boss.

7. What does the narrator suggest is a central characteristic of modern society's water and power consumption?
   A. Temperance
   B. Resourcefulness
   C. Exorbitance
   D. Caution

8. As it is used in line 27, the word *grid* most likely means:
   F. roadway system.
   G. map.
   H. utility system.
   J. populated land.

9. The boss would most likely agree with which of the following characterizations of his lodge?
   A. It is rustic, unrefined, and occasionally uncomfortable.
   B. It retains its wilderness charm in spite of concessions to some modern conveniences.
   C. It establishes an oasis in the barren North for guests demanding luxury.
   D. It focuses on premium lodging, with some guests choosing to participate in guided hunts.

10. It is most reasonable to infer from the passage that the creeks near the lodge are pristine because:
    F. they teem with fish.
    G. the lodge only draws water from one of them.
    H. civilization is not present to alter or pollute them.
    J. many specialty fishes can be readily caught in their waters.

3 █████████████████████████████ **3**

PASSAGE II
SOCIAL SCIENCE: *A Cure for Polio*

In the early twentieth century, no other disease caused as much fear and anxiety in the United States as *paralytic poliomyelitis*. *Paralytic poliomyelitis*, more commonly known as polio, was a particularly
5 devastating disease because of its effect on children. Many children stricken with polio became permanently confined to wheelchairs or died at a very early age.

It was during the summer of 1916 that Americans first realized that polio was a threatening and
10 deadly disease. As a virus, polio seemed to spread most quickly and easily during the summer months. Throughout that fateful summer, New York City experienced a polio epidemic that killed 9,000 people and left 27,000 paralyzed.
15 Even though polio was not a new disease, medical experts around the turn of the century were still uncertain about how to prevent it. While it is difficult to determine polio's first appearance in history, various accounts of lameness and paralysis suggest that polio
20 can be traced back to early Egypt. It was probably not until 1908, when two Austrian physicians identified the submicroscopic virus, that scientists began to have an accurate understanding of the disease. Until 1908, conditions such as overheating, chilling, and
25 even teething were thought to cause polio's symptoms. Some scientists and doctors even believed that diseases such as whooping cough and pneumonia were the cause of polio.

For many decades, polio research centered on
30 treating symptoms as well as developing a vaccine to prevent polio. There was no known cure for people already infected with polio, so doctors focused on managing the disease's debilitating effects. Scientists and doctors concentrated on making the polio patient
35 more comfortable and preventing fatalities. During the 1920s, the *iron lung* became a common device used to assist polio patients in breathing. When using the iron lung, patients would lie in a metal, human-sized tank for long periods of time. Sometimes, polio patients
40 would have to continue this treatment their entire lives. Serum therapy was also attempted. During this type of treatment, polio victims would receive doses of serum extracted from polio-recovered monkeys, humans, and even horses. After nearly 20 years of research and trials,
45 serum therapy was finally abandoned and deemed unsuccessful.

In the medical field, other debates occurred regarding the proper treatment of polio patients. Initially, it was thought that diseased limbs should be
50 immobilized and even placed in casts. In addition, polio patients were prescribed complete bed rest. However, other theories suggested that paralyzed arms and legs should be wrapped in hot compresses and exercised regularly to prevent muscular atrophy. This
55 latter approach soon became typical protocol because it seemed to relieve some pain and discomfort.

During World War II, the effort to cure and prevent polio in the United States was stalled because medical researchers became more involved with military issues
60 and diseases overseas. However, at the end of the War,

as numerous troops returned home and polio epidemics once again increased, attention was turned back to this dreaded disease. Finally, a breakthrough occurred during the early 1950s when a medical researcher named
65 Jonas Salk developed an effective vaccine using the tissue culture method. Salk discovered that injecting elements of the dead polio virus into healthy patients was effective, because vaccinated patients would build antibodies against the dead virus. These acquired
70 antibodies prevented any future infection.

Later, another medical researcher named Albert Sabin developed an even easier method of distributing the vaccine. Sabin's vaccine became known as the oral polio vaccine. This innovation eliminated the use of
75 needles; the vaccine was administered by mouth. Children had no difficulty tolerating the vaccine because it was infiltrated into a sugar cube. By 1955, the Salk vaccination trials were deemed successful. The government quickly established a program to administer
80 vaccines to everyone in the country. By the early 1960s, the oral Sabin vaccine replaced the Salk injections. The Sabin vaccine was a live, attenuated virus that provided longer-lasting effects. By 1964, only 121 cases of polio were reported. This was a dramatic decrease from the
85 58,000 cases reported in 1952.

While the scourge of polio is well under control in the United States, it is still a dangerous disease worldwide. Polio is especially a threat in more remote and undeveloped countries. In addition, 500,000 Americans
90 continue to live with the effects of childhood polio infections that began decades ago.

11. According to the passage, the most significant effects of the polio epidemic in America were on:
  A. the development of government programs.
  B. children stricken with the disease.
  C. the medical community that attempted to cure polio.
  D. public involvement in promoting the vaccine.

12. As it is used in the passage (line 33) the word *debilitating* most nearly means:
  F. invigorating.
  G. crippling.
  H. coercing.
  J. revitalizing.

13. According to the information presented in the passage, what would likely have happened if the iron lung had not been invented?
  A. Some polio patients would have perished more quickly.
  B. Paralysis in children would have worsened.
  C. Patients would not have received proper bed rest.
  D. Muscular atrophy would not have been prevented.

GO ON TO THE NEXT PAGE.

3   **3**

14. According to the passage, why did medical research first focus on the treatment of polio's symptoms, instead of the disease itself?
   F. Scientists and medical experts did not understand the cause of polio.
   G. A cure for the debilitating disease had recently been discovered.
   H. Funds were not available from the government to develop a cure for polio.
   J. Medical researchers were fearful of working with the polio virus.

15. As it is used in the fifth paragraph, the phrase "became typical protocol" implies that:
   A. the most common practice for treating polio became widely accepted.
   B. medical experts debated with scientists regarding the proper treatment of polio.
   C. doctors and scientists had yet to discover an effective polio treatment.
   D. there was no consistent or widespread treatment for those infected with polio.

16. Based on the passage, the author's discussion of the polio virus emphasizes the:
   F. consequential debate about dead versus live viruses for vaccines.
   G. competition among medical researchers to develop a cure.
   H. complexity of the disease and the difficulty in discovering a cure.
   J. lack of understanding in the medical community about curing diseases.

17. The information in the passage primarily suggests that:
   A. the Salk vaccine was not truly successful.
   B. Salk and Sabin had strong disagreements over a polio cure.
   C. the Salk vaccine paved the way for the Sabin oral vaccine.
   D. the use of a live virus is always better in developing a vaccine.

18. It can be reasonably inferred that the author would probably consider which of the following to be most similar to the discussion of polio in the passage?
   F. Malnutrition and starvation in developing countries.
   G. Researching and developing a cure for cancer.
   H. Obesity in the United States.
   J. Social security deficits leading to poverty.

19. According to the passage, which of the following is NOT true regarding polio?
   A. One of the most incapacitating effects of polio was the fact that it made it difficult to breathe properly.
   B. Whooping cough and pneumonia were both thought to be caused by polio infection.
   C. The season and time of year seemed to have an impact on the spread of the crippling disease.
   D. Children seemed to bear the brunt of the attack of the polio virus.

20. Based on the overall tone of the passage, which of the following statements best summarizes the author's perspective on the effects of the American polio epidemic of the early 1900s?
   F. There is virtually no residual evidence of the epidemic today.
   G. Polio continues to be a silent threat to American children.
   H. The cure for polio may be temporary and prove ineffective in the future.
   J. Thousands of Americans continue to live with the effects of polio.

3   3

PASSAGE III
HUMANITIES: *Mythology of the Chinese Zodiac*

Everyday, one takes for granted the ease of finding out what date it is. This is simplified to such a great degree by following the Gregorian calendar, based on the solar cycle, which keeps track of 365.25 days
5   each year. This has not always been the case, however. In ancient China, the calendar was based on the lunar cycle, and consisted of a repeating twelve-year sequence, each named for a different animal.

The origin of the twelve animals is mythological,
10 with the story being passed down from generation to generation. A common telling of the tale recounts a celebration to honor the Jade Emperor; all of the animals were expected to pay tribute to him on the night of the New Year and the first twelve to arrive would
15 receive a great distinction.

In order to reach the Emperor's Palace, the animals were required to cross a fast-moving river. The cunning rat arrived first, climbed atop the ox, who was a much stronger swimmer than the rat, and jumped off
20 of the ox right before reaching shore, so as to win the race. The ox received second place, followed shortly thereafter by the tiger – the strength of both animals allowed them to finish quickly. The rabbit followed, with his agility, by jumping from stone to stone across
25 the river. Next came the mighty and majestic dragon, who flew across the river. When asked why he was not first, he replied that he needed to make rain for the people of Earth and was thus delayed. His kindness earned him the fifth place in the cycle. During the
30 dragon's explanation there was a galloping sound, signaling the arrival of the horse. Suddenly, hidden coiled around the leg of the horse, appeared the snake – nearly as cunning as the rat – who darted in front of the horse taking sixth place. The horse settled for seventh, just
35 as a raft reached the shore with three more animals. The sheep (eighth), the monkey (ninth), and the rooster (tenth) had worked together to build a raft and traverse the river using their combined efforts. For this show of teamwork they were rewarded in the order that they
40 stepped off of the raft. Next to arrive was the dog, who was met with questioning looks. Supposedly the best swimmer, the dog's lateness was due to his taking a bath in the refreshing waters of the river. His vanity nearly cost him the race. Lastly was the lazy pig, who
45 stopped on the other side of the river for a feast before a attempted to cross, and was so weighed down by its meal that it arrived only moments before the Emperor declared the race to be finished.

Missing from this list of animals is the cat. Sadly,
50 he was a victim of the rat's cunning; the day before the race the rat informed the cat that he would awaken him prior to the race, so as to allow the cat to rest and save its strength for the race. The day of the race arrived, and the cat continued to sleep while the rat took his
55 spot atop the ox. When the cat awoke, the race was finished, and it has hated the rat for what it did ever since.

Beyond the twelve-year distinctions that the animals of the Zodiac lend to the calendar, there is an
60 additional ten-year overlay of five elements: water, wood, fire, metal, and earth. Each of these elements occurs two years in a row, in balance with the Yang and Yin, the governing forces of all things. Even numbered years are considered Yang, and odd numbered years
65 are considered Yin. When all factors are combined, a sixty-year repeating calendar results, the current cycle of which began in 1984.

Despite its complexity, the Calendar is followed to a certain degree, and the Chinese New Year is
70 celebrated by many. Primary among the great astrological purposes to the Zodiac is the common belief that the animal that governs the time of a person's birth will influence that person's personality for life. Whether or not that is true is a matter of debate that is sure to
75 continue for many years to come.

21. The passage primarily emphasizes the idea that:
   A. the animals that are included in the Chinese Zodiac calendar all had to find ways to reach the Emperor's Palace.
   B. the Chinese Zodiac calendar is correct in the long run, but somewhat distorted on a year-to-year basis.
   C. the Chinese Zodiac calendar is surrounded by myths and legends that still permeate Chinese society today.
   D. according to the Chinese Zodiac, the animal one is born under will directly influence that person's personality.

22. The passage begins with the phrase "Everyday, one takes for granted the ease of finding out what date it is" primarily to:
   F. draw the distinction between the ease of today's Gregorian calendar and the complexity of the Chinese Zodiac calendar.
   G. emphasize to the reader how effortless it is to use the Chinese Zodiac calendar to determine the current date.
   H. inform the reader that using a solar cycle to create a calendar is the simplest way to discern what the current date is.
   J. downplay the fact that the Chinese Zodiac calendar has a varying number of days each year while the Gregorian calendar does not.

23. In the context of the passage, the phrase "His vanity nearly cost him the race," suggests that the dog:
   A. felt that the water was so refreshing, he had no choice but to bathe in it whether it lost him the race or not.
   B. intended to look his best and be his cleanest when he reached the palace, in order to honor the Emperor.
   C. forgot that he was in a race to reach the Emperor's Palace until he saw the pig approaching the riverbank.
   D. prioritized his egotistical impulses over his desire to reach the Emperor's Palace on time.

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24. As it is used throughout the passage, the word *cunning* most nearly means:
 F. ingenuity.
 G. dependability.
 H. apprehension.
 J. tolerance.

25. According to the passage, which of the following would NOT be a possible year of the Chinese Zodiac?
 A. Wood, Yang, dragon, 3028
 B. Yin, fire, pig, 3029
 C. Rat, earth, Yang, 3052
 D. Metal, Yin, tiger, 3030.

26. The narrator uses the example of the cat in the passage (lines 49–57) most likely in order to:
 F. accentuate the fact that many animals strove to earn the Emperor's distinction but only a select few attained it.
 G. highlight the fact that the rat was very shrewd and was only out for himself in the race to the Emperor's Palace.
 H. offer proof that the cat was one of the most indolent animals and therefore did not deserve the Emperor's great distinction.
 J. provide proof that, in actuality, the ox preferred the companionship of the rat to that of the cat.

27. It can be inferred from the passage that the Emperor most highly valued what traits among the animals?
 A. Deceitfulness and compassion.
 B. Goodwill and narcissism.
 C. Generosity and unanimity.
 D. Gluttony and collaboration.

28. According to the passage, all of the following are true regarding the animals that reached the Emperor's Palace EXCEPT:
 F. the rabbit was very nimble in crossing the river and made it across quite easily.
 G. the tiger's vigor allowed him to swim across the river effortlessly.
 H. the snake wound himself around the dragon's leg to reach the end of the race.
 J. the pig narrowly reached the end of the race to the Emperor's Palace.

29. As it is used in line 9, the word *mythological* most closely means:
 A. legitimate.
 B. bona fide.
 C. ludicrous.
 D. legendary.

30. It can be reasonably inferred from the passage's last sentence that the narrator:
 F. believes that the Chinese Zodiac influences the personality of those who believe in the astrology of the Chinese Zodiac system.
 G. does not have a rigid stance on the multitude of elements composing the Chinese Zodiac calendar and how these elements affect people.
 H. thinks that calendars are too intricate to ever fully grasp how and when the days of each year occur.
 J. is undecided as to whether or not the Chinese Zodiac system really has an effect on the calendar year.

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PASSAGE IV

NATURAL SCIENCE: *The Eating Habits of Related Primates*

Scientists know very little about the eating habits of our ancestors who lived over two and a half million years ago. To solve this problem, scientists have started examining chimpanzees' hunting behavior and diet to
5 find clues about our own prehistoric past.

It is not difficult to determine why studying chimpanzees might be beneficial. Modern humans and chimpanzees are actually very closely related. Experts believe that chimpanzees share about 98.5 percent of
10 our DNA sequence. If this is true, humans are more closely related to chimpanzees than to any other animal species.

In the early 1960s, Dr. Jane Goodall began studying chimpanzees in Tanzania. Before the 1960s,
15 scientists believed that chimpanzees were strict vegetarians. It was Goodall who first reported that meat was a natural part of the chimpanzee diet. In fact, Goodall discovered that chimpanzees are actually very proficient hunters. Individual chimpanzees have been
20 known to hunt and eat more than 150 small animals each year. Among the chimpanzees' favorite prey are the red colobus monkey, feral pig, and various small antelope species. The red colobus monkey is one of the most important animals in the chimpanzees' diet. In one
25 notable study, the red colobus monkey accounted for more than 80 percent of the animals eaten by one group of chimpanzees.

Despite these findings, scientists still maintain that chimpanzees are mostly fruit-eating creatures. In fact,
30 meat composes only about 3 percent of the chimpanzee diet. This is substantially less than the quantity of meat consumed by the average human. Studies show that chimpanzees do most of their hunting in the dry season. August and September appear to be the most popular
35 months for hunting. During the dry season, food shortages in the forest cause the chimpanzees' body weight to drop. Consequently, chimpanzees supplement their diets with meat. During the height of the dry season, the estimated meat intake is about 65 grams of meat per day
40 for adult chimpanzees. This is comparable to the quantity of meat eaten by modern human societies whose members forage when other food sources are scarce. The chimpanzees' eating habits also closely resemble those of the early human hunter-gatherers.
45 Humans and chimpanzees are the only members of the Great Ape family that hunt and eat meat on a regular basis. However, like chimpanzees, humans are not truly carnivorous creatures. In fact, most ancient humans ate a diet composed mostly of plants, and even
50 modern humans are considered omnivores because they eat fruits, vegetables, and meat.

Most people assume that food choices are based solely on nutritional costs and benefits. Although it is clear that the hunting habits of chimpanzees are
55 guided mostly by nutritional needs, some aspects of the chimpanzees' behavior are not well explained by nutrition alone. Researchers suggest that chimpanzees might hunt for social gain. For instance, a male chimpanzee might try to demonstrate his competence to other male

60 chimpanzees by killing prey. Chimpanzees may also use meat as a political tool to punish rivals and reward friends. However, a study also shows that female chimpanzees that receive large portions of meat after a hunt have healthier and stronger offspring. This indicates
65 that there might be reproductive benefits to eating meat as well.

The information that scientists have been able to gather regarding chimpanzee hunting behavior is shedding some light on the eating habits of our ancestors.
70 Further investigation is needed, however, to provide stronger evidence regarding this aspect of man's prehistoric past.

31. The main purpose of the passage is to:
   A. explore biological and physiological similarities between humans and chimpanzees.
   B. examine the hunting behavior and diet of chimpanzees and compare them to similar human activity.
   C. discuss the health benefits of hunting and eating meat while simultaneously predicting the effect of these behaviors on chimpanzee offspring.
   D. bring attention to the pioneering research of Dr. Jane Goodall in Tanzania.

32. It can be inferred from the passage that chimpanzees:
   F. find that the red colobus monkey is the easiest prey to hunt.
   G. only hunt when no other plant food is available.
   H. hunt only during the dry season when other food sources are scarce.
   J. vary their diet depending on environmental factors.

33. According to the passage, the word *proficient* (line 19) most nearly means:
   A. skilled.
   B. individual.
   C. incompetent.
   D. important.

34. According to the passage, which of the following statements regarding the eating habits of chimpanzees is true?
   F. Chimpanzee eating habits cannot be studied in the wild.
   G. Chimpanzee eating habits are directly influenced by social factors.
   H. It is not possible to determine the exact diet of chimpanzees.
   J. Chimpanzee eating habits are not related to those of humans.

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35. Based on the context of the passage, the author most likely makes the comparison between chimpanzees and humans (lines 45–51) in order to suggest that:
  A. chimpanzees are more similar to early humans than to modern humans.
  B. studies of chimpanzees will contribute to an understanding of early humans.
  C. early hunter-gatherers typically ate more meat than did chimpanzees.
  D. data collected on chimpanzees cannot be applied to the study of humans.

36. As it is used in the passage, the word *forage* (line 42) most nearly means:
  F. consume meats.
  G. alter their diets.
  H. search for food.
  J. lose weight.

37. According to the passage, Dr. Jane Goodall's research was important because:
  A. Dr. Goodall was the first scientists to study chimpanzees in their natural habitat.
  B. Dr. Goodall discovered previously undocumented chimpanzee behavior.
  C. Dr. Goodall had always argued that chimpanzees were actually carnivorous creatures.
  D. Dr. Goodall discovered that red colobus monkeys make up 80% of chimpanzees' diets.

38. It can be inferred from the passage that ancient humans and chimpanzees:
  F. share a DNA structure that is more similar than that of any two other animals.
  G. only ate meat when fruit, grains, and vegetables were not available.
  H. differ from other related species.
  J. hunted for social gain and prestige in their communities.

39. According to the passage, chimpanzees hunt primarily because of:
  A. increased numbers of red colobus monkeys.
  B. food shortages during the dry season.
  C. their DNA sequence.
  D. their preference for meat over plants.

40. In the context of the passage, the tone in lines 52–66 can best be described as:
  F. affectionate.
  G. humorous.
  H. somber.
  J. informational.

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

4 ⭘ ⭘ ⭘ ⭘ ⭘ ⭘ ⭘ ⭘ **4**

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

Researchers have noticed sudden decay in limestone grave markers in a cemetery downwind from a coal-burning power plant. Two studies were conducted to examine this decay process.

Study 1

A key mineral component of limestone is *feldspar*, which is also abundant in ground soil. Feldspar, as it weathers and decays, breaks down into another mineral, *kaolinite*. The weathering process is often expedited by moisture from rain and humidity. Researchers measured the levels of feldspar and kaolinite in the soil of the cemetery and other locations at specific distances from the cemetery before and after rain showers. The results are shown in Table 1. (Note: The soil sample sizes were the same for each location tested.)

Study 2

The researchers believe that the emissions from the nearby power plant are somehow affecting the decay of the limestone. Levels of common gases – carbon dioxide (CO_2), oxygen (O_2), nitrogen dioxide (NO_2), and sulfur (S) – in the atmosphere were tested at the cemetery and other locations at specific distances from both the cemetery and the power plant. Measurements in parts per million (ppm) were recorded in Table 2.

Table 1				
	Before rain		After rain	
Distance from cemetery (m)	Amount of feldspar in the soil (g/ft^3)	Amount of kaolinite soil (g/ft^3)	Amount of feldspar in the soil (g/ft^3)	Amount of kaolinite in the soil (g/ft^3)
0	26.3	13.7	25.2	14.6
125	29.1	12.9	28.5	13.7
225	29.9	12.4	29.6	12.6
325	30.8	12.1	30.7	12.2
425	32.4	11.5	32.3	11.6

Table 2					
Distance from power plant (m)	Distance from cemetery (m)	CO_2 levels (ppm)	O_2 levels (ppm)	NO_2 levels (ppm)	S levels (ppm)
0	125	7	3	13	26
100	225	8	5	10	22
200	325	10	12	9	17
300	425	11	14	5	10
400	525	13	17	3	5

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1. Which of the following factors was varied in Study 1?
   A. Distance from power plant
   B. Size of soil sample
   C. Distance from cemetery
   D. Common gas levels

2. Carbon monoxide is another gaseous byproduct associated with coal-burning power plants. If carbon monoxide levels behave like the sulfur gas levels in Study 2, one would expect that carbon monoxide levels:
   F. would increase as distance from power plant increases.
   G. would be higher when O_2 levels are higher.
   H. would decrease as distance from power plant increases.
   J. would be lower when NO_2 levels are higher.

3. According to Study 1, *kaolinite* levels are highest at what distance from the cemetery?
   A. >400 meters
   B. Between 200 and 400 meters
   C. Between 100 and 300 meters
   D. <100 meters

4. According to the results of Study 2, as distance from the power plant decreases:
   F. sulfur levels decrease.
   G. sulfur and NO_2 levels increase.
   H. NO_2 and O_2 levels decrease.
   J. CO_2 and O_2 levels increase.

5. According to the results of Study 1, as distance from the cemetery increases, feldspar decay:
   A. increases only.
   B. is not affected.
   C. is reversed.
   D. decreases only.

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PASSAGE II

Coronary heart disease affects millions of people world-wide each year. It is the end result of a build up of plaque (cholesterol) on the interior walls of the arteries that supply the muscle of the heart. Most individuals with coronary heart disease show no evidence of disease for decades as the disease progresses before the first onset of symptoms, often a "sudden" heart attack. After decades of building up on the artery walls, the plaque may reduce the blood flow to the heart muscle. There are several hypotheses that have been proposed to explain the causes of plaque build-up leading to coronary heart disease.

Behavioral Hypothesis

The primary causes of coronary heart disease are behavioral factors such as diet, risky behaviors, and level of physical activity. Coronary heart disease is associated with smoking, obesity, *hypertension* (chronic high blood pressure) and a lack of vitamin C. According to one study, individuals who consume large amounts of saturated fats and trans-fats have high levels of cholesterol and are at higher levels of risk for heart disease. Vegetarians have been shown to have a 24% reduced risk of heart disease due to dietary modifications alone. In addition, extra weight is thought to lead to higher total cholesterol levels, high blood pressure, and an increased risk of coronary heart disease. Obesity increases the chances of developing other risk factors for heart disease, especially high blood pressure, high blood cholesterol, and diabetes. Smoking is also a major cause of heart disease as it puts individuals at higher risk of developing a number of chronic disorders. Furthermore, people who are not physically active have a greater risk of heart attack than do people who exercise regularly. Exercise burns calories, helps to control cholesterol levels and diabetes, and may lower blood pressure. Exercise also strengthens the heart muscle and makes the arteries more flexible.

Familial Hypothesis

Coronary heart disease is genetically inherited, meaning it tends to run in families. For example, people whose parents or siblings had a heart or circulatory problem before the age of 55 are at greater risk for heart disease than someone who does not have that family history. Risk factors (including hypertension, diabetes, and obesity) may also be passed from one generation to another. Studies have determined that the single greatest indicator of risk for coronary heart disease is family history. Other studies have shown isolated populations to be significantly more or less susceptible to coronary heart disease than is the general population. Isolated populations share the same *gene pool* (a set of genetic traits found within a population), which supports the proposition that family history is the primary cause and indicator of the disease.

6. To accept the evidence presented in the Familial Hypothesis, one must assume that all members of a population sharing the same gene pool have:
   F. a varied family history.
   G. a common family history.
   H. a history of high risk for heart disease.
   J. a history of low risk for heart disease.

7. One advantage of the Behavioral Hypothesis is that it best explains why heart disease is more common in which of the following groups?
   A. Isolated populations.
   B. Smokers.
   C. Individuals with a family history of heart disease.
   D. Vegetarians.

8. According to the Familial Hypothesis, individuals whose parents or siblings had a heart or circulatory problem before the age of 55 are:
   F. members of an isolated population.
   G. at a lower risk for heart disease than someone who does not have that family history.
   H. at a higher risk for heart disease than someone who does not have that family history.
   J. at the same risk for heart disease as someone who does not have that family history.

9. Which of the following is a criticism that supporters of the Behavioral Hypothesis would make of the Familial Hypothesis?
   A. Behaviors and dietary norms are passed down between generations.
   B. Obesity is not related to being at risk for heart disease.
   C. Exercise is not related to being at risk for heart disease.
   D. Family history is the single greatest indicator of risk for heart disease.

10. How would supporters of the Behavioral Hypothesis explain the studies cited in the Familial Hypothesis regarding isolated populations?
    F. A common gene pool does not indicate familial ties.
    G. All members in an isolated population are at a high level of risk for heart disease.
    H. Members within isolated populations rarely behave in a similar manner.
    J. Members within isolated populations often behave in a similar manner.

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11. Assume that increased cholesterol levels result in increased risk for coronary heart disease. How would supporters of the Familial Hypothesis explain the study cited in the Behavioral hypothesis?

A. Family history is a major factor in developing hypertension.

B. A common gene pool determines heart disease risk level.

C. Behaviors and dietary norms are passed down from family members.

D. Family history is a major factor in determining cholesterol levels.

12. The Behavior Hypothesis and the Familial Hypothesis are similar in that they both:

F. name family history as the greatest factor of risk for heart disease.

G. name diet as the greatest factor of risk for heart disease.

H. cite hypertension, cholesterol, and obesity as major risk indicators.

J. promote a vegetarian diet.

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PASSAGE III

A scientist tested the ability of 5 newly engineered drugs to kill penicillin-resistant bacteria.

Experiment 1

Equal numbers of penicillin-resistant bacteria were put into flasks containing 10.0 milliliters of a nutrient medium. The flasks were incubated for 1 hour at 37°C with different concentrations of the 5 drugs shown in Table 1. A control consisted of bacteria incubated in the medium without any drugs. The bacteria were washed to remove residual drug traces and grown on nutrient agar plates for 7 days. During this time, the bacteria reproduced, forming colonies, which were then counted at the end of the seventh day. Plates with more colonies were assumed to have more live bacteria at the end of the 1-hour incubation period. Table 1 shows the number of colonies counted. The drug-free control showed 50 colonies at the end of 7 days.

Table 2				
Drug	Incubation time (h)			
	1	6	12	24
	Number of colonies:			
R	22	8	2	0
S	39	12	4	1
T	40	15	6	2
U	41	18	7	3
V	45	22	9	5
None	50	50	50	50

Note: Numbers of colonies are averages for 7 replicates (identical samples).

Table 1				
Drug	Drug concentration (mM)			
	5	10	15	25
	Number of colonies:			
R	41	26	9	0
S	42	29	12	2
T	45	35	20	5
U	47	38	21	6
V	50	40	22	7

Notes: *mM is micromolar
Numbers of colonies are averages for 5 replicates (identical samples).

Experiment 3

Permeability coefficients measure a drug's ability to break through the cell membrane of a bacterium. The larger the permeability coefficient, the faster the drug is able to transfer through the membrane. The molecular mass, in atomic mass units (amu), and permeability coefficient, in centimeters per second (cm/s) of the 5 drugs at 37°C were measured. The results are shown in Table 3.

Table 3		
Drug	Molecular mass (amu)	Permeability coefficient (cm)
R	455	10^{-7}
S	470	10^{-8}
T	485	10^{-5}
U	500	10^{-10}
V	515	10^{-11}

Experiment 2

Bacteria were handled as described in Experiment 1 with two exceptions: all drugs were tested at the same concentration and the incubation time of each culture was varied. Table 2 shows the number of colonies counted for Experiment 2.

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13. Based on Experiment 1, at a concentration of 10 mM, which drug was most effective at killing bacteria?
   A. Drug R
   B. Drug S
   C. Drug T
   D. Drug V

14. Based on the results of Experiment 3, which drug enters bacteria cells most quickly?
   F. Drug R
   G. Drug S
   H. Drug T
   J. Drug V

15. If Experiment 2 were repeated with Drug U and an incubation time of 3 hours, the number of colonies counted would most likely be:
   A. more than 50.
   B. between 41 and 50.
   C. between 18 and 41.
   D. fewer than 18.

16. Which of the following statements best describes the relationship between the molecular mass and the permeability coefficient of the drugs, as shown in Experiment 3?
   F. As the molecular mass decreases, the permeability coefficient increases.
   G. As the molecular mass increases, the permeability coefficient increases.
   H. As the molecular mass decreases, the permeability coefficient remains constant.
   J. As the molecular mass increases, the permeability coefficient remains constant.

17. Which of the following statements best describes the relationship between incubation time and number of live bacteria in Experiment 2?
   A. As incubation time increases, the number of live bacteria increases only.
   B. As incubation time increases, the number of live bacteria decreases only.
   C. As incubation time increases, the number of live bacteria quickly increases, then slowly decreases.
   D. As incubation time increases, the number of live bacteria quickly decreases, then slowly increase.

18. In Experiment 1, what was the relationship between drug concentration and the drug's effectiveness in killing penicillin-resistant bacteria?
   F. Based on Experiment 1, there is no relationship between drug concentration and drug effectiveness.
   G. Some of the drugs were most effective at the lowest concentration used while others were most effective at the highest concentration used.
   H. All 5 drugs were most effective at the highest concentration used.
   J. All 5 drugs were most effective at the lowest concentration used.

19. The experimental procedures used in Experiment 1 and 2 differed in that in Experiment 1:
   A. incubation time was held constant, while drug concentration was varied.
   B. incubation time was varied, while drug concentration was held constant.
   C. incubation time and drug concentration were both held constant.
   D. incubation time and drug concentration were both varied.

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PASSAGE IV

Large lakes have their own climate that differs from the climate in adjacent forest and sand dune areas. A scientist performed the following studies to learn more about lake climates.

Study 1

A remote site in a rural area was selected where a large body of water was located next to a vast stretch of sand dunes. After both the lake and the sand dunes had been exposed to full sunlight for 8 hours, air temperature readings, in degrees Celsius (°C), were taken at the surface every 30 meters (m) across the water and sand, starting above the deepest part of the lake, and moving toward a point on the shoreline. The results are shown in Figure 1.

Figure 1

Study 2

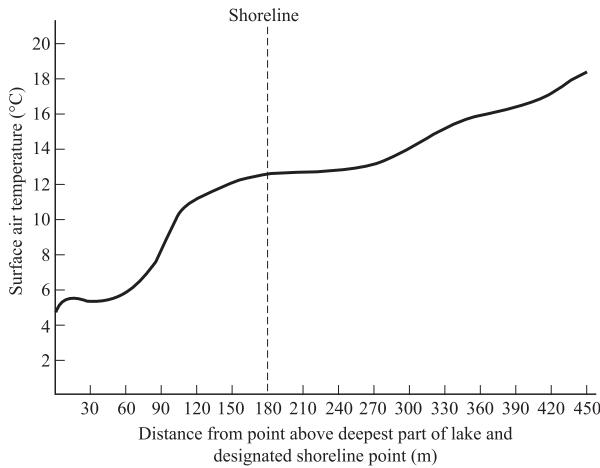Air temperatures were recorded hourly over a 24-hour period at 3 sites: above the deepest part of a large body of water (the lake site), an adjacent sand dune site, and a nearby forest site. Temperatures were recorded on 30 consecutive days during the summer and 30 consecutive days during the winter. Each hourly temperature was averaged for the season. The results are shown in Figure 2.
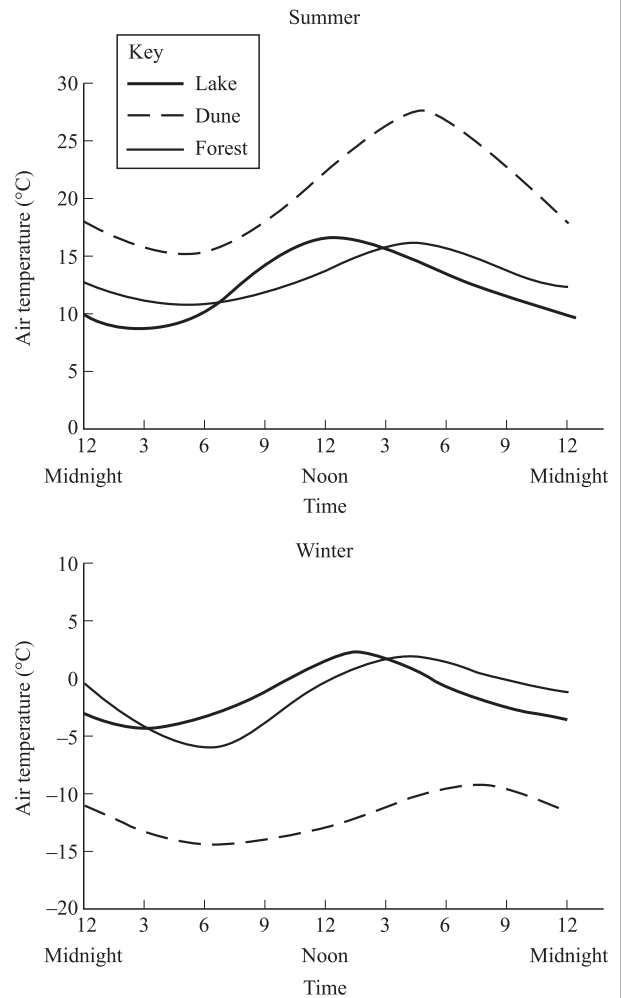

Figure 2

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20. According to Study 1, between what two distances, from the point above the deepest part of the lake to the point on the shoreline, was there the sharpest increase in temperature?

 F. Between 30 meters and 60 meters
 G. Between 60 meters and 90 meters
 H. Between 90 meters and 120 meters
 J. Between 120 meters and 150 meters

21. Based on the results of Study 2, which of the following generalizations could be made about the difference in temperatures between summer and winter for the three sites?

 A. Dune areas are the warmest areas in the summer and the coldest areas in the winter.
 B. Lake areas are the coldest areas in the winter and the warmest areas in the summer.
 C. Forest areas are the warmest areas in the winter and the warmest areas in the summer.
 D. Dune areas are the coldest areas in the winter and the coldest areas in the summer.

22. If Study 2 produced results typical of any dune site, which of the following generalizations could be made about seasonal climates?

 F. The temperature variation at a dune site throughout a typical day is greater during the winter than it is during the summer.
 G. The temperature variation at a dune site throughout a typical day is less during the winter than it is during the summer.
 H. The maximum temperature at a dune site throughout a typical winter day is the same as that at a lake site.
 J. The maximum temperature at a dune site throughout a typical winter day is the same as that at a forest site.

23. According to Study 2, the temperature difference between the forest and dune sites at 9 p.m. on a typical summer day is approximately:

 A. 0°C.
 B. 5°C.
 C. 8°C.
 D. 15°C.

24. According to Figure 2, the conditions at the lake site are most similar to the conditions at the forest site at which of the following times?

 F. Midnight
 G. 9 a.m.
 H. 3 p.m.
 J. 9 p.m.

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PASSAGE V

Horses are susceptible to hoof infections that can seriously impair the horses' ability to walk. Horse breeders routinely administer dietary supplements in addition to the horses' regular feed in order to prevent these infections. A side effect of one of the these supplements – supplement X – is increased urination, which can sometimes lead to dehydration in the animal.

Twenty (20) adult horses, each weighing approximately 1,000 pounds, were randomly selected and assigned to two groups of 10 horses each. Group R received dietary supplement X while Group S received a placebo (a substance containing no supplement). Each horse in both groups received the same amount of feed and water each day. The horses were placed in individual stalls for 7 days, during which time their urine output was measured. The results are shown in Table 1.

Table 1		
	Group R	Group S
	Average urine output per horse (gallons):	
Day 1	1.8	2.1
Day 2	1.9	2.0
Day 3	2.0	1.8
Day 4	2.2	1.9
Day 5	2.5	1.8
Day 6	2.6	2.0
Day 7	2.8	1.9

25. Which of the following generalizations best fits the results of the study?
   A. The effects of dietary supplement X on urinary output cannot be immediately detected.
   B. Dietary supplements should be administered over time in order to be effective.
   C. Dietary supplement X has no effect on urinary output in horses.
   D. The horses in Group R urinated less frequently than did the horses in Group S.

26. In order to best determine the effects of dietary supplement X in this experiment, one should examine:
   F. the type of feed that each horse was given.
   G. the amount of feed that each horse was given.
   H. the urinary output over time of each horse.
   J. the average urinary output of a third group.

27. Based on the information in Table 1, on which day did the control group have the highest urinary output?
   A. Day 7
   B. Day 4
   C. Day 3
   D. Day 1

28. During the study, several of the horses in Group R began showing signs of dehydration. According to the passage, what is the most likely cause of this?
   F. The low urinary output of the horses in Group R.
   G. The amount of water that the horses in Group R were given.
   H. The high urinary output of the horses in Group R.
   J. The lack of supplements in the diet of the horses in Group R.

29. Which of the following statements is supported by the data presented in Table 1?
   A. Urinary output increased over time for Group S only.
   B. Urinary output increased over time for Group R only.
   C. Urinary output increased over time for neither Group R or Group S.
   D. Urinary output increased over time for both Group R and Group S.

30. Do the results of the study show that dietary supplement X could cause dehydration in horses?
   F. Yes, because the urinary output increased over time in the group that received the supplement.
   G. Yes, because the control group maintained a relatively constant urinary output.
   H. No, because the urinary output stayed the same over time in the group that received the supplement.
   J. No, because the urinary output of the control group was not adequately measured.

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PASSAGE VI

People use many different chemicals each day for common household tasks such as cleaning and food preparation. Since the inception of consumer protection laws, chemicals come with toxicity warning labels, directions about proper use, and cautions about the hazards of improper use. Some household chemicals can be quite dangerous, especially when mixed together. One such example is the reaction that occurs when mixing household bleach (NaOCl) with ammonia (NH_3). The by-products of the reaction vary depending on the concentrations of the reactants. The following experiments were conducted to determine the levels at which certain by-products resulted from mixing bleach and ammonia.

Experiment 1

A known by-product of the reaction of bleach and ammonia is chlorine gas (Cl_2). Chlorine gas has an intensely disagreeable suffocating odor, and is very poisonous. To determine the quantities of bleach and ammonia that, when mixed together, produce chlorine gas, a varying quantity of bleach was added to eight different ammonia–water solutions and the resulting chlorine gas from each mixture was collected and measured. A solution of 1.0 mole (mol) of NH_3 in 1 kg of water was used in each trial. A certain quantity of NaOCl was added to each of the solutions; the amount added was gradually increased for each trial. The amount of chlorine gas produced in each trial was recorded and graphed in Figure 1.
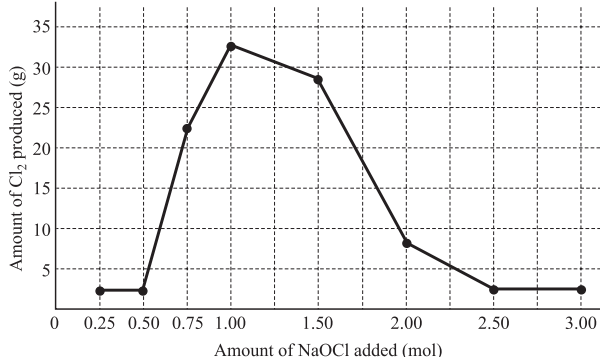
Figure 3

Experiment 2

Another known by-product of the reaction of bleach and ammonia is nitrogen trichloride (NCl_3). Nitrogen trichloride is a yellow, oily, pungent-smelling liquid, often found as a by-product of chemical reactions between nitrogen-containing compounds and chlorine. It is highly explosive. To determine the quantities of bleach and ammonia that, when mixed together, produce NCl_3, again a varying quantity of bleach was added to eight different ammonia–water solutions and the resulting NCl_3 from each mixture was measured. A solution of 1.0 mole (mol) of NH_3 in 1 kg of water was used in each trial. A certain quantity of NaOCl was added to each solution; the quantity added

was gradually increased for each trial. The amount of nitrogen trichloride produced in each trial was recorded in see Table 1.

Table 1		
Trial	NaOCl level (mol)	Amount of NCl_3 produced (mol)
1	0.50	0.01
2	1.00	0.03
3	1.50	0.04
4	2.00	0.06
5	2.50	0.44
6	3.00	0.98
7	3.50	1.00
8	4.00	1.00

Experiment 3

In yet another reaction, bleach and ammonia combined under certain conditions produce a compound known as chloramine. Chloramine (NH_2Cl) is a toxic substance commonly used in low concentrations as a disinfectant in municipal water systems as an alternative to chlorination. To determine the mixture of bleach and ammonia at which NH_2Cl is produced, a varying amount of ammonia was added to eight different bleach–water solutions and the resulting chlorine gas from each mixture was collected and measured. A solution of 1.0 mole (mol) of NaOCl in 1 kg of water was used in each trial. A certain quantity of NH_3 was added to each solution; the quantity of ammonia added was gradually increased for each trial. The amount of chloramine produced in each trial was recorded in Table 2.

Table 2		
Trial	NH_3 level (mol)	Amount of NH_2Cl produced (mol)
1	0.50	0.05
2	1.00	0.08
3	1.50	0.11
4	2.00	0.14
5	2.50	0.17
6	3.00	0.21
7	3.50	0.23
8	4.00	0.25

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31. Which of the following is the most likely reason that amounts greater than 3.00 mol of bleach were not tested in Experiment 1? The results showed that:
  A. amounts less than 3.00 mol of bleach increased the amount of chlorine gas produced.
  B. when more bleach was added the mixture became too volatile.
  C. adding more bleach no longer increased the level of ammonia.
  D. amounts greater than 1.00 mol of bleach decreased the amount of chlorine gas produced.

32. Based on the results of Experiment 3, as the NH_3 level increased from 0.50 to 4.00 mol, the greatest increase in the amount of NH_2Cl produced occurred:
  F. between the trials of 0.50 and 1.00 mol of NH_3.
  G. between the trials of 1.50 and 2.00 mol of NH_3.
  H. between the trials of 2.50 and 3.00 mol of NH_3.
  J. between the trials of 3.50 and 4.00 mol of NH_3.

33. If a ninth trial were conducted in Experiment 3, adding 1.25 mol of NH_3 to the bleach–water solution, the amount of NH_2Cl produced would be closest to:
  A. 0.06 mol.
  B. 0.10 mol.
  C. 0.12 mol.
  D. 0.16 mol.

34. Each of the following is a by-product resulting from mixing bleach and ammonia EXCEPT:
  F. Cl_2
  G. NCl_3
  H. NaOCl
  J. NH_2Cl

35. The production of a certain plastic calls for a mixture of bleach and ammonia. However, the presence of chlorine gas is highly undesirable. Based on the results of Experiments 1, 2, and 3, which of the following specifications should be chosen?
  A. Minimum of 2.00 mol NaOCl and maximum 1.00 mol NH_3
  B. Minimum of 1.00 mol NaOCl and maximum 1.00 mol NH_3
  C. Exactly of 1.50 mol NH_3 and exactly 1.50 mol NaOCl
  D. Exactly of 1.00 mol NH_3 and exactly 1.50 mol NaOCl

36. In Experiment 2, different quantities of NaOCl were added to the ammonia solution resulting in the production of nitrogen trichloride. The amounts of nitrogen trichloride produced for 3.00, 3.50, and 4.00 mol of NaOCl added were approximately the same. Which of the following best explains why the production of NCl_3 was limited, based on this observation and the results of the experiment?
  F. NaOCl absorbs the extra NH_3.
  G. The amount of chlorine gas produced slows the reaction.
  H. NaOCl binds with the H_2O in the solution and causes the reaction rate to decrease.
  J. The amount of NH_3 available for reaction is limited, and once used up, the reaction stops.

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PASSAGE VII

Water pressure influences the rate at which water flows. As water pressure increases, so does the rate of flow. Water pressure can be defined as the amount of force that the water exerts on the container it is in. The more water that is in the container, the greater the water pressure will be. Some students conducted the following experiment:

Experiment

Students used tacks to punch holes in an empty plastic 2-liter bottle. The students created 4 holes, each 1-inch apart, from top to bottom. The tacks were left in each hole as the hole was created. The bottle was filled to the top with water and placed on a table. An 8 × 9-inch pan with a piece of blotting paper was placed lengthwise in front of the bottle. A ruler was placed in the pan to measure the spot at which the water stream touched the paper (range of water stream). The students removed the tack nearest the top of the bottle and marked the spot where the water stream touched the paper (range of water stream). The tack was then replaced, the bottle was filled to the top, and the next tack was removed. The spot where the water stream touched the paper was measured. Rate of flow was indicated by the length of the water stream. This procedure was repeated a total of 4 times, once for each tack. The results are recorded in Table 1 below.

Table 1		
Tack	Position of Tack in the bottle	Approximate range of water stream (inches)
1	First (top)	2.3
2	Second	4.2
3	Third	4.7
4	Fourth (bottom)	5.5

37. Based on Table 1, water pressure is greatest:
  A. at the top of the full container.
  B. at the bottom of the full container.
  C. when the water stream is 4.2 inches long.
  D. when the water stream is 4.7 inches long.

38. Which of the following is an assumption that the students made prior to beginning the experiment?
  F. Water pressure has no effect on the water stream produced.
  G. The rate of flow cannot be accurately determined using tacks and plastic bottles.
  H. The rate of flow corresponds directly to the water stream produced.
  J. Water pressure and rate of flow are the two most important characteristics of water.

39. Based on the results of the experiment, removing Tack 3:
  A. created a 4.7 inch water stream.
  B. caused the bottle to empty more quickly than did removing Tack 4.
  C. increased the total water pressure in the bottle.
  D. created a 5.5 inch water stream.

40. Suppose that the students removed the tacks in order, replaced each tack after measuring the water stream, but did not re-fill the bottle after removing and replacing each tack. According to the passage, the water stream would most likely:
  F. be identical to the first experiment.
  G. increase for each tack removed.
  H. be less than or equal to the previous tack removed.
  J. decrease at first and then increase.

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.

Presently in the United States, it is illegal to intentionally disrupt many kinds of radio transmissions, including those for cellular telephone service. Organizations such as places of worship, public schools, and movie theaters, are calling for exceptions to be made to the law in cases where placing and receiving telephone calls has proven annoying to others. However, some people argue that they are entitled to the cellular service they pay for no matter where they may be, that telephone courtesy should remain a personal responsibility, and that cellular users rely on uninterrupted service in case of emergencies at work or at home.

In your opinion, should cellular signal disruptors be allowed in places where phone calls are perceived as annoying?

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 opinion.

◼◼◼ **ANSWER KEY**

English Test

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

Mathematics Test

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

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<tr><td>4. H</td><td>24. F</td><td>4. G</td><td>24. H</td></tr>
<tr><td>5. B</td><td>25. D</td><td>5. D</td><td>25. A</td></tr>
<tr><td>6. F</td><td>26. G</td><td>6. G</td><td>26. H</td></tr>
<tr><td>7. C</td><td>27. C</td><td>7. B</td><td>27. D</td></tr>
<tr><td>8. H</td><td>28. H</td><td>8. H</td><td>28. H</td></tr>
<tr><td>9. B</td><td>29. D</td><td>9. A</td><td>29. B</td></tr>
<tr><td>10. H</td><td>30. G</td><td>10. J</td><td>30. F</td></tr>
<tr><td>11. B</td><td>31. B</td><td>11. D</td><td>31. D</td></tr>
<tr><td>12. G</td><td>32. J</td><td>12. H</td><td>32. H</td></tr>
<tr><td>13. A</td><td>33. A</td><td>13. A</td><td>33. B</td></tr>
<tr><td>14. F</td><td>34. H</td><td>14. F</td><td>34. H</td></tr>
<tr><td>15. A</td><td>35. B</td><td>15. C</td><td>35. A</td></tr>
<tr><td>16. H</td><td>36. H</td><td>16. F</td><td>36. J</td></tr>
<tr><td>17. C</td><td>37. B</td><td>17. B</td><td>37. B</td></tr>
<tr><td>18. G</td><td>38. J</td><td>18. H</td><td>38. H</td></tr>
<tr><td>19. B</td><td>39. B</td><td>19. A</td><td>39. A</td></tr>
<tr><td>20. J</td><td>40. J</td><td>20. H</td><td>40. H</td></tr>
</table>