



SAT[®] **Practice Test**

Reading Test

65 MINUTES, 52 QUESTIONS

Turn to Section 1 of your answer sheet to answer the questions in this section.

DIRECTIONS

Each passage or pair of passages below is followed by a number of questions. After reading each passage or pair, choose the best answer to each question based on what is stated or implied in the passage or passages and in any accompanying graphics (such as a table or graph).

Questions 1-10 are based on the following passage.

This passage is adapted from Jane Austen's *Persuasion*, originally published in 1818.

Line Sir Walter Elliot, of Kellynch Hall, in Somersetshire,
was a man who, for his own amusement, never took up
any book but the Baronetage; there he found occupation
for an idle hour, and consolation in a distressed one;
5 there his faculties were roused into admiration and
respect, by contemplating the limited remnant of the
earliest patents; there any unwelcome sensations, arising
from domestic affairs changed naturally into pity and
contempt as he turned over the almost endless creations
10 of the last century; and there, if every other leaf were
powerless, he could read his own history with an
interest which never failed. This was the page at which
the favorite volume always opened:

ELLIOT OF KELLYNCH HALL.

15 "Walter Elliot, born March 1, 1760, married, July
15, 1784, Elizabeth, daughter of James Stevenson,
Esq. of South Park, in the county of Gloucester, by
which lady (who died 1800) he has issue Elizabeth,
born June 1, 1785; Anne, born August 9, 1787;
20 a still-born son, November 5, 1789; Mary, born
November 20, 1791."

Precisely such had the paragraph originally stood
from the printer's hands; but Sir Walter had improved
it by adding, for the information of himself and his
25 family, these words, after the date of Mary's birth—
"Married, December 16, 1810, Charles, son and heir of
Charles Musgrove, Esq. of Uppercross, in the county of
Somerset," and by inserting most accurately the day of
the month on which he had lost his wife.

30 Then followed the history and rise of the ancient and
respectable family, in the usual terms; how it had been
first settled in Cheshire; how mentioned in Dugdale,
serving the office of high sheriff, representing a borough
in three successive parliaments, exertions of loyalty,
35 and dignity of baronet, in the first year of Charles II,
with all the Marys and Elizabeths they had married;
forming altogether two handsome duodecimo pages,
and concluding with the arms and motto:

"Principal seat, Kellynch Hall, in the county
40 of Somerset," and Sir Walter's handwriting again
in this finale:

—"Heir presumptive, William Walter Elliot,
Esq., great grandson of the second Sir Walter."

Vanity was the beginning and the end of Sir Walter
45 Elliot's character; vanity of person and of situation.
He had been remarkably handsome in his youth; and,
at fifty-four, was still a very fine man. Few women
could think more of their personal appearance than
he did, nor could the valet of any new made lord be
50 more delighted with the place he held in society. He
considered the blessing of beauty as inferior only to
the blessing of a baronetcy; and the Sir Walter Elliot,
who united these gifts, was the constant object of his
warmest respect and devotion.

55 His good looks and his rank had one fair claim on
his attachment; since to them he must have owed a
wife of very superior character to anything deserved
by his own. Lady Elliot had been an excellent woman,
sensible and amiable; whose judgment and conduct, if
60 they might be pardoned the youthful infatuation which
made her Lady Elliot, had never required indulgence
afterwards. She had humored, or softened, or concealed

his failings, and promoted his real respectability for seventeen years; and though not the very happiest being
 65 in the world herself, had found enough in her duties, her friends, and her children, to attach her to life, and make it no matter of indifference to her when she was called on to quit them. Three girls, the two eldest sixteen and fourteen, was an awful legacy for a mother
 70 to bequeath, an awful charge rather, to confide to the authority and guidance of a conceited, silly father.

She had, however, one very intimate friend, a sensible, deserving woman, who had been brought, by strong attachment to herself, to settle close by her,
 75 in the village of Kellynch; and on her kindness and advice, Lady Elliot mainly relied for the best help and maintenance of the good principles and instruction which she had been anxiously giving her daughters.

This friend, and Sir Walter, did not marry, whatever
 80 might have been anticipated on that head by their acquaintance. Thirteen years had passed away since Lady Elliot's death, and they were still near neighbors and intimate friends, and one remained a widower, the other a widow.

1

The main purpose of the passage is to

- A) describe a main character and his personal and family history.
- B) provide an overview of a family and a nearby neighbor.
- C) discuss some unfortunate traits in a main character's nature.
- D) explain the relationship between a main character and his deceased wife's friend.

2

Which choice best summarizes the first two paragraphs of the passage (lines 1-21)?

- A) A prominent and important family has had its history recorded for posterity's sake.
- B) A long-established family is celebrated in one of the most popular books in England.
- C) Published family lineages were historically brief accounts, with many details omitted.
- D) A widower takes a great deal of pleasure in reading an account of his own family history.

3

The author most likely includes the phrase "with all the Marys and Elizabeths they had married" in the description of the family history in the fourth paragraph (lines 30-38) in order to

- A) indicate that such family histories often read very repetitively.
- B) establish the type of woman most commonly married by the elite.
- C) inform the reader of the most common British names for women.
- D) provide the reader with as much detailed information as possible.

4

Sir Walter can best be described as

- A) the head of one of the most foremost families in England.
- B) a man known to be a voracious reader.
- C) one who values personal beauty second only to title.
- D) someone who takes great pride in the vanity of his family.

5

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 1-3 ("Sir Walter . . . Baronetage")
- B) Lines 22-29 ("Precisely such . . . wife.")
- C) Lines 30-31 ("Then followed . . . terms.")
- D) Lines 50-54 ("He considered . . . devotion.")

6

As used in line 47, "fine" most nearly means

- A) adequate.
- B) attractive.
- C) reasonable.
- D) light.

7

It can most reasonably be inferred that Lady Elliot

- A) had a positive effect on Sir Walter.
- B) died after a long illness.
- C) suffered from unhappiness most of her life.
- D) was surrounded by friends who supported and guided her.

8

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 58-62 (“Lady Elliot . . . afterwards”)
- B) Lines 62-64 (“She had . . . years”)
- C) Lines 64-68 (“And though . . . them”)
- D) Lines 72-75 (“She had . . . Kellynch”)

9

Which of the following can be inferred from the last paragraph (lines 79-84)?

- A) The idea that Sir Walter and Lady Russell might wed occurred to those who knew them.
- B) Sir Walter and Lady Russell are likely to wed in the future due to deaths of their respective spouses.
- C) Lady Russell was prevented by her close relationship with Lady Elliot from accepting the hand of Sir Elliot.
- D) Lady Russell’s beauty was not equal to that of Sir Walter’s, which prevented the likelihood of their marriage.

10

As used in line 80, “head” most nearly means

- A) face.
- B) countenance.
- C) possibility.
- D) inevitably.

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Questions 11-21 are based on the following passage.

The following is an excerpt from Elliott A. Medrich's *Young Adolescents and Discretionary Time Use: The Nature of Life Outside School*.

Time use is one way of viewing important commonalities and differences in the experience of growing up.

Line Studies of time use typically focus on one of two
5 issues: how much time adolescents commit to particular activities; or what adolescents do, often without regard to the amount of time spent on each activity. Both styles of research enhance our understanding of the relationship between what adolescents do with their
10 discretionary time and the circumstances—family background, gender, neighborhood environment—which serve as a backdrop to time use decision making.

Five domains of out-of-school time use are described below, including activities alone or with friends, activities
15 with parents, in-home or out-of-home chores, jobs and responsibilities, organized activities including participation in recreational and cultural programs supervised by adults, and television viewing and use of other media. Patterns of time use across each of the
20 domains are summarized as follows.

Time Alone and with Friends

Young adolescence marks the emergence of peers as crucial actors in time use decision making. In contrast to younger children, time use research with adolescents
25 documents the increasing import of peer relations, and in parallel fashion, increasing divergence in the activity sets of boys and girls. Among boys, there is still an interest in “active” forms of leisure (like sports), while among girls an increasing amount of time is spent socializing, talking
30 and engaging in more passive pursuits.

Activities with Parents and Family

Early adolescents spend little time with their parents and families. Eating and television viewing tend to be the most frequent activities, although girls seem to
35 spend somewhat more time interacting with family members than boys. This seems to reflect changes in parent-child relationships—parents do not determine how young adolescents spend their time as they do with younger children.

Chores, Jobs, Responsibilities and Earned Income

This domain reveals several important characteristics of young adolescence—changing views of the capabilities of boys and girls; reinforcement of role stereotypes; and the desire among young people to
45 earn money and, thereby, gain increased control of their

time use options. Boys and girls are typically assigned different kinds of chores at home—boys do things like yard work, while girls are more likely to shop and babysit. These activities also come to characterize the
50 kinds of jobs held among young adolescents employed for the first time (estimates indicate that as many as 20 percent of fourteen- and fifteen-year-olds work regularly for money outside the home). Young adolescents are more interested in jobs for the sake of
55 income rather than for the “skill building” or “character building” aspects of early work experience.

Television and Other Media

Television viewing peaks in early adolescence and begins to decline through the middle school years.
60 Interestingly, it is sometimes the only activity young adolescents do with their parents or siblings. Other media are beginning to play a significant role in their lives. Many young adolescents spend as much as four to six hours a day listening to music (usually radio),
65 and it begins to emerge as a significant backdrop to other activities, to a degree defining a cornerstone of adolescent peer culture.

Organized Activities

There is tremendous diversity within the domain
70 of organized activities, with regard to the substance, structure, and management styles of the available services. Programs are provided by both public and non-profit sectors, and most young adolescents participate in at least one group, lesson, class, or
75 club during the course of the school year (studies report that between sixty and eighty percent of young adolescents become involved). Levels of participation in particular activities are different for boys and girls, and for children from different income groups. Factors
80 contributing to participation include: involvement of friends, interest in the activity, and whether or not the program or activity offers some measure of autonomy.

Community facilities, as distinct from organized activities, represent a somewhat different type of
85 time use. Physical access is important to decisions young adolescents make about using facilities like libraries, recreation centers and parks. Since they are still minimally mobile, they need services close to home. Providers must be sensitive to the growing
90 independence of the age group and to differences in needs across and within communities, across gender and across age groups.

**Average Minutes Spent in Major Activities
Twelve to Seventeen Year Olds by Sex: Weekdays**

Activity	Boys	Girls
Market work	0:23	0:21
Household work	0:16	0:40
Personal care	0:48	1:11
Eating	1:13	1:05
Sleeping	8:24	7:58
School	5:14	5:42
Studying	0:29	0:37
Church	0:03	0:07
Visiting	0:17	0:25
Sports	0:52	0:37
Outdoors	0:10	0:10
Hobbies	0:07	0:04
Art activities	0:12	0:06
Playing	0:37	0:13
TV	2:23	1:48
Reading	0:10	0:13
Household conversations	0:21	0:30
Other passive leisure	0:21	0:14
NA	0:14	0:17
Percent of time accounted for by above activities	93.1%	91.9%

11

The position that the author takes in this passage can best be described as

- A) a social scientist presenting his findings based on adolescent research.
- B) a parent concerned with how his children are spending their time.
- C) an adult reflecting on the various ways he spent time as an adolescent.
- D) an educator seeking more clarity on how to make school time engaging.

12

As used in line 5, “commit” most nearly means

- A) entrust.
- B) institutionalize.
- C) pledge.
- D) give.

13

The references to “family background, gender, neighborhood environment” in lines 10-11 primarily serve to

- A) provide an example of the factors that may influence how adolescents use their time.
- B) demonstrate all the differences that determine adolescent use of time.
- C) illustrate what activities rank as the most popular amongst adolescents.
- D) call attention to what determines use of time when comparing adolescents to adults.

14

The discussion in lines 22-30 of how boys and girls choose to spend their time primarily serves to

- A) explain societal roles.
- B) highlight a variance.
- C) warn of a disturbing trend.
- D) emphasize biological differences.

15

As used in line 36, “reflect” most nearly means

- A) return.
- B) redirect.
- C) reveal.
- D) imitate.

16

The author indicates that adolescents' chores and jobs

- A) decrease the amount of time spent with family.
- B) create current social stereotypes.
- C) are generally divided along gender lines.
- D) provide more experience than income.

17

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 32-33 ("Early adolescents . . . families")
- B) Lines 46-49 ("Boys and . . . babysit")
- C) Lines 49-53 ("These activities . . . home")
- D) Lines 53-56 ("Young adolescents . . . experience")

18

According to the author, all of the following may affect student participation in clubs, groups, or classes EXCEPT

- A) whether the student is a boy or a girl.
- B) whether the student is allowed to try things on his or her own.
- C) whether the student's parents are supportive of the activity.
- D) whether the student knows anyone else involved with the group.

19

Based on the text and figure, it can be inferred that listening to music is not included in the table because

- A) adolescents don't listen to music.
- B) listening to music accounts for the missing time needed to reach 100 percent.
- C) adolescents listen to music while doing other activities.
- D) researchers didn't ask about listening to music.

20

Which statement best summarizes the information presented in the table?

- A) Adolescents of both sexes divide their time over a dozen different activities.
- B) Adolescents spend the majority of their time either sleeping or going to school.
- C) The average adolescent has become increasingly busy compared to the previous decade.
- D) The types of activities boys engage in accounts for their lack of sleep as compared to those of girls.

21

According to the table, which statement is true about the amount of time spent by adolescents on certain activities?

- A) Girls engage in a fewer number of hobbies as compared to boys.
- B) The fact that boys spend 24 fewer minutes than girls doing household work accounts for stereotypical gender roles.
- C) Girls dedicate more of their time to personal care than boys do to sports and TV watching combined.
- D) Girls and boys allocate their time differently for every activity except time spent outdoors.

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Questions 22-31 are based on the following passage.

The following passage is an excerpt from a speech given by John Stuart Mill to the British House of Commons in April 1868. In it, Mill argues that a proposed ban on capital punishment by that legislative body should not be approved.

Line . . . Aggravated murder is now practically the only
crime which is punished with death by any of our lawful
tribunals; and we are even now deliberating whether the
extreme penalty should be retained in that solitary case.

5 When there has been brought home to any one, by
conclusive evidence, the greatest crime known to the
law; and when the attendant circumstances suggest no
palliation of the guilt, no hope that the culprit may even
yet not be unworthy to live among mankind, nothing
10 to make it probable that the crime was an exception
to his general character rather than a consequence of
it, then I confess it appears to me that to deprive the
criminal of the life of which he has proved himself
to be unworthy—solemnly to blot him out from the
15 fellowship of mankind and from the catalogue of the
living—is the most appropriate, as it is certainly the
most impressive, mode in which society can attach to
so great a crime the penal consequences which for the
security of life it is indispensable to annex to it.

20 I defend this penalty, when confined to atrocious
cases, on the very ground on which it is commonly
attacked—on that of humanity to the criminal; as
beyond comparison the least cruel mode in which it
is possible adequately to deter from the crime. If, in
25 our horror of inflicting death, we endeavor to devise
some punishment for the living criminal which shall
act on the human mind with a deterrent force at all
comparable to that of death, we are driven to inflictions
less severe indeed in appearance, and therefore less
30 efficacious, but far more cruel in reality. Few, I think,
would venture to propose, as a punishment for
aggravated murder, less than imprisonment with hard
labor for life; that is the fate to which a murderer would
be consigned by the mercy which shrinks from putting
35 him to death.

But has it been sufficiently considered what sort of
a mercy this is, and what kind of life it leaves to him?
If, indeed, the punishment is not really inflicted—if
it becomes the sham which a few years ago such
40 punishments were rapidly becoming—then, indeed, its
adoption would be almost tantamount to giving up the
attempt to repress murder altogether. But if it really is
what it professes to be, and if it is realized in all its rigor

by the popular imagination, as it very probably would
45 not be, but as it must be if it is to be efficacious, it will
be so shocking that when the memory of the crime
is no longer fresh, there will be almost insuperable
difficulty in executing it. What comparison can there
really be, in point of severity, between consigning a
50 man to the short pang of a rapid death, and immuring
him in a living tomb, there to linger out what may be
a long life in the hardest and most monotonous toil,
without any of its alleviations or rewards—debarred
from all pleasant sights and sounds, and cut off from
55 all earthly hope, except a slight mitigation of bodily
restraint, or a small improvement of diet? Yet even such
a lot as this, because there is no one moment at which
the suffering is of terrifying intensity, and, above all,
because it does not contain the element, so imposing to
60 the imagination, of the unknown, is universally reputed
a milder punishment than death—stands in all codes
as a mitigation of the capital penalty, and is thankfully
accepted as such.

22

Which choice best describes the structure of the first two paragraphs?

- A) A general rule is given, the attempt to end that rule is acknowledged, and a description of when that rule should apply is explained.
- B) The application of a law is given, followed by the history of that law, and then the modern use of the law.
- C) A belief is established and a counterargument to that belief is reviewed.
- D) A punishment is acknowledged, a description of the punishment is provided, and a rejection of that punishment is stated.

23

The author most strongly implies which of the following about the “criminal” who has committed aggravated murder (line 13)?

- A) Society must value his life despite his actions.
- B) There may be evidence exonerating him.
- C) He no longer deserves to live due to his actions.
- D) It is likely that he is sorry for what he has done.

24

The purpose of the third paragraph is to

- A) relate an anecdote.
- B) attack a rival.
- C) offer a concession.
- D) qualify a position.

25

The author believes that the punishment of “imprisonment with hard labor for life” (lines 32-33) is

- A) the less cruel approach to punishing aggravated murder.
- B) the likely alternate choice to capital punishment.
- C) the best deterrent to future crime.
- D) the next best alternative to capital punishment.

26

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 20-22 (“I defend . . . criminal”)
- B) Lines 22-24 (“as beyond . . . crime”)
- C) Lines 33-35 (“that is . . . death”)
- D) Lines 36-37 (“But has . . . to him?”)

27

The author poses the question at the beginning of the fourth paragraph (lines 36-63) in order to

- A) point out the innately cruel natures of those with whom he disagrees.
- B) emphasize that alternate punishments leave criminals a merciful life.
- C) indicate that his opponents may not have fully considered the consequences of an alternative.
- D) request that his audience help him in understanding the argument it is making.

28

The author of this passage would most likely agree with which of the following statements?

- A) Capital punishment is more merciful than life imprisonment because it is more immediate.
- B) Life imprisonment is a more economical punishment than capital punishment.
- C) Life in prison gives the criminal time to repent of his sins while capital punishment does not.
- D) Neither capital punishment nor life imprisonment is a good way to deter crime.

29

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 30-33 (“Few, I . . . life”)
- B) Lines 38-42 (“If, indeed . . . altogether”)
- C) Lines 48-56 (“What comparison . . . diet”)
- D) Lines 56-63 (“Yet . . . such”)

30

The author compares life in prison to a “living tomb” because those imprisoned

- A) have no hope at all.
- B) suffer from a fear of the unknown.
- C) are cut off from enjoyable sensory experiences.
- D) face execution for their crimes.

31

As used in lines 56-57, “such a lot” most nearly means

- A) such an area.
- B) such a condition.
- C) such a group.
- D) so much.

Questions 32-41 are based on the following passage.

The following article examines the relationship between brain size and socialization among wasps.

A solitary wasp—the kind that lives and forages for food alone—has a fairly small brain. Type out a lowercase letter in 10-point text and you’ll get an idea of its size.

But tiny as that brain is, its social cousins, living together in honeycombed nests, have even smaller ones. And that size difference might provide some key information about the difference between insect societies and vertebrate societies.

Biologists have studied the societies of vertebrates—from flocks of birds, to schools of fish, to communities of humans—enough to come up with something called the “social brain hypothesis.” Generally, it goes something like this: Social interaction presents challenges that require a lot of brain power, as that interaction requires organisms to navigate complicated territory, including avoiding conflict and building alliances.

Therefore, vertebrates that live in societies have bigger brains. The more complex the organism’s society, the bigger its brain regions for processing complex information will be. Scientists believe the complexity of human societies may be one of the reasons we have such large, developed brains.

Sean O’Donnell, a biology professor at Drexel, has spent almost the entirety of his more than 20-year career studying wasps. He says these picnic terrors—actually critical members of the insect world that prey on pest species—represent ideal candidates for seeing whether that hypothesis applies to insects, because they have so much variation.

Some wasps are solitary. Some live in small, primitive groups. Others live in larger, more complex societies. “There are lots of intermediate stages,”

O’Donnell said.

When O’Donnell, with support from the National Science Foundation’s Directorate for Biological Sciences, looked at the brains in 29 related species of wasps spanning the social spectrum, he found that living in a society did indeed affect the size of their brains. It just made them smaller, instead of bigger.

His research uncovered another interesting difference from vertebrates: the complexity of the wasps’ societies seemed to have no significant effect on the size of their brains. The big drop off in size occurred between solitary and social wasps. In contrast,

the brains of wasps in simple societies showed no significant size differences between those in complex societies.

“That suggests to me that going from solitary to a small society is the significant transition,” O’Donnell said.

Part of what makes vertebrate societies so brain-intensive is that they usually involve groups of organisms with different agendas that aren’t related to one another—most of the people you know aren’t members of your family.

Insect societies, however, are made up of groups of cooperating close relatives with shared objectives. Wasps might not need the type of brainpower required for social interaction because there’s much less of it in their nests and colonies. The insects cooperate and rely on each other without the type of negotiation that can be required in vertebrate societies.

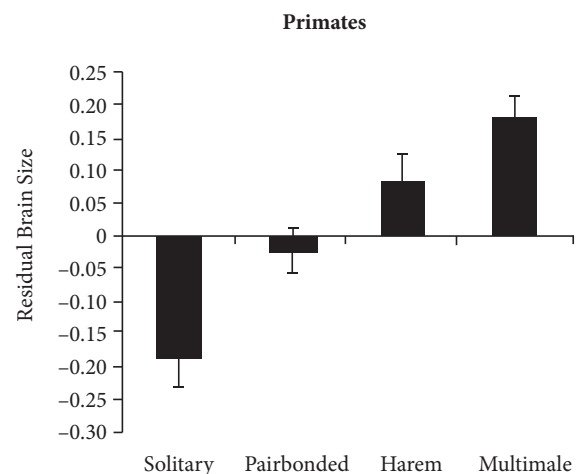
But what advantage could a smaller, less complex brain offer a species? As O’Donnell puts it, “Brains are expensive.”

Neural tissues require more energy to develop and maintain than almost any other kind, and biologists have found that natural selection will find the optimal balance between the metabolic costs of developing particular areas of the brain and the benefits yielded.

In some ways, the social wasps may “share” brainpower. Individually, their brains might not stack up to their solitary relatives, but the colony as a whole is “smart.”

O’Donnell says the next steps for his work will replicate the wasp research with termites and bees, which also offer a variety of social complexity.

“We would expect to see similar patterns,” he said.



32

The passage is written from the perspective of someone who is

- A) currently conducting research on varying insect brain sizes.
- B) writing an article based on the findings of a researcher.
- C) advocating for greater public understanding of an often-maligned creature.
- D) compelled to address an issue that has deep personal meaning for him.

33

It is reasonable to conclude that the continuing goal for Sean O'Donnell in conducting his research is to

- A) establish a general pattern between invertebrate insect socialization and brain size.
- B) further investigate the relationship between brain size and complexity of society.
- C) illustrate that the benefits of a smaller brain are greater than those of a larger brain.
- D) apply his findings from wasp research to assist homeowners dealing with termites.

34

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 27-31 ("He says . . . variation")
- B) Lines 42-45 ("His research . . . brains")
- C) Lines 68-72 ("Neural tissues . . . yielded")
- D) Lines 77-79 ("O'Donnell . . . complexity")

35

What effect does the phrase "Generally, it goes something like this" in lines 13-14 have on the tone of the passage?

- A) It creates a serious tone by stressing that something is so important it must be explained twice.
- B) It creates a mocking tone by implying that the reader is unable to understand a concept.
- C) It creates an informal tone by translating a scientific theory into a straightforward idea.
- D) It creates a jovial tone by letting the reader know that this topic is not one of great significance.

36

As used in line 22, "complexity" most nearly means

- A) difficulty.
- B) simplicity.
- C) intricacy.
- D) density.

37

The purpose of the fourth paragraph (lines 19-24) is to

- A) further illustrate how the social brain hypothesis applies to vertebrates.
- B) establish the main difference between vertebrates and invertebrates.
- C) give greater insight into how the majority of humans interact with one another.
- D) argue that the smarter a person is, the larger his or her brain is likely to be.

38

The author indicates that the wasp

- A) has evolved past the need for a large brain as it is controlled by a central queen within the society.
- B) lives in a society composed of its own relatives and so does not need to address varying goals among the society.
- C) lives in a society that is simple, rather than complex, which does not require a larger brain.
- D) does not need a large brain because its society does not require cooperation.

39

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 14-18 (“Social . . . alliances”)
- B) Lines 32-33 (“Some live . . . groups”)
- C) Lines 58-59 (“Insect . . . objectives”)
- D) Lines 60-64 (“Wasps might . . . societies”)

40

What information discussed in the passage is represented by the graph?

- A) The information in lines 7-9 (“And that . . . societies”)
- B) The information in lines 20-22 (“The more . . . will be”)
- C) The information in lines 46-49 (“In contrast . . . societies”)
- D) The information in lines 74-76 (“Individually . . . smart”)

41

Which statement about the effect of society and brain size is supported by the graph?

- A) It is unlikely that brains will grow bigger as societies become more complex.
- B) A harem does not constitute a complex society.
- C) There is little difference between the brain size of a solitary versus pair-bonded organism.
- D) Lemurs, which have a relatively large residual brain size compared to those of other animals, are most likely living in multi-male societies.

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Questions 42-52 are based on the following passage.

Passage 1 is adapted from Randall J. Hunt, "Do Created Wetlands Replace the Wetlands that are Destroyed?" Passage 2 is adapted from T.M. Lee, K.H. Haag, P.A. Metz, and L.A. Sacks, "Comparative Hydrology, Water Quality, and Ecology of Selected Natural and Augmented Freshwater Wetlands in West-Central Florida."

Passage 1

Wetlands are often considered "kidneys of the landscape" because of their role in filtering the effects of surrounding land use, and have widely recognized functions that include storm/flood water retention, shoreline protection, water-quality improvement, and wildlife habitat. In fact, more than one-third of our endangered species are associated with wetlands even though wetlands comprise less than five percent of the landscape! We have lost vast areas of the pre-settlement wetland acreage—more than 50 percent nationally and more than 95 percent in some states. Increasing population, development, farming, and landowners' rights have resulted in increasing amounts of our wetland resource being destroyed and have increased the pressure on the wetlands that remain.

In the broadest sense, mitigation is a process that focuses on: 1) avoiding wetland loss, 2) minimizing the effect of wetland loss, and 3) compensating for unavoidable wetland loss. In general usage, however, mitigation has become synonymous with number 3 and now refers to replacing the function and structure of a destroyed wetland by creating, restoring or enhancing a wetland somewhere else. This mitigation of wetland loss has been mandated by federal law, and there have been numerous large and small wetland mitigation projects in every part of the nation.

It is not widely accepted that mitigation projects are successful. Although the current wetland permit programs assume that wetland loss is being ameliorated, no long-term, interdisciplinary research shows unequivocally that a created wetland has fully replaced the lost function resulting from a wetland's destruction. Secondly, there is a concern that created wetlands do not provide in-kind compensation. That is, many hard-to-create wetland types (such as fens, bogs and sedge meadows) are being replaced with common, easy-to-create wetland types (cattail marsh), or the "quality" of the resulting mitigation wetland is not equal to the wetland that was destroyed. A third concern is that placing mitigation projects in areas distant from the destroyed wetland will result in the wetland

functions being replaced in areas away from where they are needed and/or in areas that are not wetland deficient. Finally, there is great interest in mitigation "banks"—large wetland restoration or creation projects that can serve as compensation credit for wetland losses elsewhere in a given region. The people agree that while large intact wetland acreage is desirable, there is some concern that mitigation banking projects will not provide meaningful mitigation of the cumulative effects of widely distributed, small-acreage wetland loss.

Passage 2

Augmentation has maintained some of the functional capacity of the four augmented wetlands located within the well fields during the augmentation period (which began in the early 1980s). Without augmentation, the four augmented wetlands would have been dry during the majority of this period. The historical flooding pattern of W29 Impaired Marsh illustrated the most optimistic flooding regime that could have been expected in the absence of augmentation: 20 percent or less of the total wetland area was inundated for most of the time, and entirely dry conditions prevailed for as much as 80 percent of the time.

In addition, the soil moisture comparisons at the natural and impaired marshes, together with the hydrogeologic sections of the augmented wetlands, indicate that without augmentation, the water table would have been too deep below the wetlands to provide the soil moisture conditions necessary for aquatic algae, wetland plants, and freshwater macroinvertebrates to survive. Wetland plants would likely have been replaced with upland vegetation, as occurred at W29 Impaired Marsh where slash pines became established throughout the marsh during prolonged dry conditions (Haag and others, 2005). Cypress tree mortality would have been widespread, as was evident in W19 Impaired Cypress. Moreover, because both of the impaired wetlands were affected less severely by ground-water withdrawals than the four augmented wetlands prior to their augmentation, even more severe deterioration could have been expected.

42

The author of Passage 1 suggests that wetland mitigation is unsuccessful due to

- A) increasing population growth destroying natural wetlands.
- B) the very small percentage of land categorized as natural wetland.
- C) the fact that mitigation banks are overly large and wasteful.
- D) the distance that may exist between created wetlands and destroyed natural wetlands.

43

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 1-6 (“Wetlands are . . . habitat”)
- B) Lines 11-15 (“Increasing population . . . remain”)
- C) Lines 39-44 (“A third . . . deficient”)
- D) Lines 44-51 (“Finally, there . . . loss”)

44

As used in line 15, “pressure” most nearly means

- A) weight.
- B) demands.
- C) force.
- D) difficulty.

45

The primary purpose of the second paragraph (lines 16-26) is to

- A) argue against the efficacy of wetland mitigation projects.
- B) describe how specific wetland mitigation projects are accomplished.
- C) offer three reasons wetland mitigation is necessary.
- D) offer insight into the purpose of wetland mitigation processes.

46

The reference to the “W29 Impaired Marsh” (lines 58-59) serves mainly to

- A) highlight how well an augmented marsh did during flooding.
- B) account for the establishment of an historical flood pattern.
- C) demonstrate how a wetland is eventually destroyed.
- D) provide an example of the flood patterns of a natural, non-augmented marsh.

47

As used in line 59, “regime” most nearly means

- A) establishment.
- B) organization.
- C) condition.
- D) scheme.

48

It can be inferred from the second paragraph of Passage 2 (lines 65-82) that wetland augmentation was successful because it

- A) helped prevent plants associated with dry land from developing within the wetland area.
- B) eradicated many invasive cypress trees .
- C) significantly deepened the water table as compared to previous flooding occurrences.
- D) forced groundwater withdrawals.

49

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 65-72 (“In addition . . . survive”)
- B) Lines 72-76 (“Wetland plants . . . conditions”)
- C) Lines 77-78 (“Cypress tree . . . Cypress”)
- D) Lines 78-82 (“Moreover, because . . . expected”)

50

Which choice best states the relationship between the two passages?

- A) Passage 2 provides evidence which refutes a stance taken in Passage 1.
- B) Passage 2 offers a cautionary tale regarding a practice that Passage 1 describes in favorable terms.
- C) Passage 2 attacks the results of a research study mentioned in Passage 1.
- D) Passage 2 considers a theoretical solution to a problem, while Passage 1 offers an application of that solution.

51

In lines 27-28, the author of Passage 1 implies that not all mitigation projects are successful. How would the authors of Passage 2 respond to this implication?

- A) With endorsement, as the results from the study in Passage 2 found augmented wetlands offered no benefit to the environment.
- B) With limited agreement, as the study in Passage 2 did not show that augmented wetlands fully replaced the functions of natural wetlands.
- C) With contempt, as Passage 1 implies that there is no solution to a problem that has already been solved.
- D) With confusion, because Passage 1 seems to be discouraging scientists and the public from trying to save the wetlands.

52

Which choice would best support the claim that the author of Passage 1 recognizes the importance of the successful retention of aquatic algae, wetland plants, and freshwater macroinvertebrates mentioned in Passage 2?

- A) Lines 6-9 (“In fact . . . landscape”)
- B) Lines 19-23 (“In general . . . else”)
- C) Lines 34-39 (“That is . . . destroyed”)
- D) Lines 47-51 (“The people . . . loss”)

No Test Material On This Page

Writing and Language Test

35 MINUTES, 44 QUESTIONS

Turn to Section 2 of your answer sheet to answer the questions in this section.

DIRECTIONS

Each passage below is accompanied by a number of questions. For some questions, you will consider how the passage might be revised to improve the expression of ideas. For other questions, you will consider how the passage might be edited to correct errors in sentence structure, usage, or punctuation. A passage or a question may be accompanied by one or more graphics (such as a table or graph) that you will consider as you make revising and editing decisions.

Some questions will direct you to an underlined portion of a passage. Other questions will direct you to a location in a passage or ask you to think about the passage as a whole.

After reading each passage, choose the answer to each question that most effectively improves the quality of writing in the passage or that makes the passage conform to the conventions of standard written English. Many questions include a “NO CHANGE” option. Choose that option if you think the best choice is to leave the relevant portion of the passage as it is.

Questions 1–11 are based on the following passage.

OMG, GMOs!

A new type of food has entered the consumer and legislative **1** arenas, they are the GMO (genetically modified organism). A GMO is any type of organism that has been altered through the use of genetic engineering. There are two main types of GMO: process-based and product-based. A process-based GMO is one that has been enhanced through biotechnology for productivity or yield. In this type of GMO, the end-use has not itself been altered, only the process by which it is **2** produced has been changed. A product-based GMO

1

- A) NO CHANGE
- B) arenas and they are
- C) arenas:
- D) arenas;

2

- A) NO CHANGE
- B) produced is different.
- C) produced has been altered.
- D) produced.

is one that has been enhanced through biotechnology in a way that alters the end-use of that product. **3**

Currently, products that are GMOs, of either type, **4** is not required to be labeled as GMOs. However, there is a bill before the United States Congress that would allow the Food and Drug Administration to require a “contains GMO” label on such products.

The proponents of the bill believe a lack of labeling **5** is bad to the American public in three fundamental ways. First, the lack of labels hides the full extent of non-natural techniques utilized in producing GMOs, thereby limiting consumers’ full knowledge of products. Second, this knowledge deficit prevents consumers from not only recognizing the health risks of consuming such products **6** and understanding the true extent of those risks. Third, with no labels to guide them, consumers cannot confidently choose products that align with their beliefs concerning animal treatment, environmental stewardship, and **7** what religion they are.

3

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

Indeed, the product itself is genetically changed.

Should the writer make this addition here?

- A) Yes, because it helps to complete the description of the object being discussed.
- B) Yes, because it introduces an idea that is not yet included in the passage.
- C) No, because it does not match the current structure of the paragraph.
- D) No, because it is redundant and implies the reader is unable to understand the topic matter.

4

- A) NO CHANGE
- B) isn’t required
- C) are not required
- D) not required

5

- A) NO CHANGE
- B) is destructive towards
- C) provides harm for
- D) harms

6

- A) NO CHANGE
- B) but
- C) but also
- D) as well as

7

- A) NO CHANGE
- B) religious restrictions.
- C) religious restrictions they have.
- D) their religion.

(1) The arguments against requiring food labels could be characterized as less idealistic and more pragmatic than those promoting food labels. (2) As opponents of the bill point out, food labels in general are notoriously both misleading and uninformative. (3) Adding a label that reads “contains GMO” would provide no insight into what “GMO” means or why consumers might need to be warned against it. (4) The general confusion resulting from food labels is due in part to the limited space on which to provide information as well as the consumers’ limited knowledge of what they are reading. (5) The wording proposed in the bill would not address either of these issues. **8**

Opponents also argue that most foods Americans consume have contained GMOs since the early 1990s.

9 More than half of the corn, soybean, and canola crops in the U.S. have genetically modified traits. By this point, the label would need to be placed on nearly all products, thus making its utility very limited. One might as well put a label on every food product in the grocery store that says “contains food.” Regardless of **10** if the bill is passed, **11** information about how food is grown is available if people just look it up.

8

To make this paragraph most logical, sentence 3 should be placed

- A) where it is now
- B) after sentence 1
- C) after sentence 4
- D) after sentence 5

9

Which of the following provides a specific detail that reinforces the main point of the previous sentence?

- A) NO CHANGE
- B) Crops may or may not contain GMOs.
- C) Corn and canola have been a staple of our diet for several centuries.
- D) Crops are beginning to fall out of favor due to containing GMOs.

10

- A) NO CHANGE
- B) whether
- C) when
- D) if in fact

11

The writer wants a concluding sentence that restates the main argument of the paragraph. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) consumer food choices are generally made based on what food is available rather than what information is available.
- C) the American public knows right from wrong when it comes to their personal food choices.
- D) consumers are more likely to shop for the cheapest food available than pay more for organic.

Questions 12–21 are based on the following passage.

While at Work, Just Chill Out

The idea that happy workers are productive workers is **12** gaining traction with American businesses. Many businesses have been utilizing data or conducting **13** there own research to better understand how they can provide their workers with the most enjoyable working environment and experience. These aspects of working life have historically been treated as the most easily dismissed complaints of an office. Now, these employee concerns are being earnestly researched for cost-saving purposes.

14 It is one of the more common complaints in the workplace, and also one of the most regularly dismissed, has been temperature. This complaint usually comes from women—and for a good reason. Research shows that many buildings’ temperature settings are based on a historically established metabolic-equivalent measurement standard. “Metabolic equivalent” expresses how much energy the body requires to perform tasks such as sitting, walking, and running. The metabolic equivalent still in use today was calculated in the 1930s and is based on that of a 155-pound male. **15**

12

- A) NO CHANGE
- B) even bigger and better
- C) rocking the boat
- D) rocking and rolling

13

- A) NO CHANGE
- B) their
- C) they’re
- D) its

14

- A) NO CHANGE
- B) It is a more common complaints in the workplace,
- C) It is one of the most common complaints in the workplace,
- D) One of the most common complaints in the workplace,

15

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

Today, however, the workforce has diversified considerably, and this measurement no longer captures the rate of the majority of American workers.

Should the writer make this addition here?

- A) Yes, because it provides support for the claim made in the previous sentence.
- B) Yes, because it demonstrates the reason the use of metabolic equivalents is flawed.
- C) No, because it would be better placed elsewhere in the passage.
- D) No, because it contradicts the main idea of the passage.

While the human body may seem to be primarily at rest while **16** sitting, but the reality tells another story. As we sit, our bodies are constantly at work maintaining brain function, regulating blood flow, and controlling vital organs, all at an average temperature of 98.6 degrees. When the external temperature is low, the body must work harder in order to perform these basic functions.

17 Due to the increased energy the body exerts when it is too cold, there is a direct link between temperature and worker productivity. Concentration and the ability to perform basic tasks, such as typing without error, are the most common competencies to become compromised when the external temperature in offices is kept too low. The longer that bodies must work to compensate for lower external **18** temperatures: the more pronounced deficiencies and errors become.

16

- A) NO CHANGE
- B) sitting but the reality
- C) sitting, the reality
- D) sitting; but the reality

17

Which choice most smoothly and effectively introduces the writer's discussion of temperature and worker productivity in this paragraph?

- A) NO CHANGE
- B) Many people have asked the question "How does temperature affect a worker's ability to perform tasks well?"
- C) There is a clear link between productivity in the workplace and temperature, and this link should not be ignored.
- D) DELETE the underlined sentence.

18

- A) NO CHANGE
- B) temperature, the more
- C) temperature; the more
- D) temperature. The more

Outside of employee productivity, competency, and happiness, the influences of room temperature **19** have a large affect on cost savings for a company. First of all, it takes a great deal of energy, and therefore money, to keep an office space at the standard 68-72 degrees Fahrenheit of most large-scale office buildings in the United States. Heating, Ventilating, and Air Conditioning systems (HVAC) account collectively for **20** 28 percent of the electricity and 86 percent of the natural gas consumed by office buildings. Even in today's technology-driven workplace, cooling accounts for **21** more electricity usage than does lighting.

19

- A) NO CHANGE
- B) have a large effect
- C) has a large affect
- D) has a large effect

20

Which choice offers the most accurate interpretation of the data in the chart?

- A) NO CHANGE
- B) 28 percent of natural gas and 86 percent of electricity
- C) 19 percent of electricity and 14 percent of natural gas
- D) the majority of electricity and natural gas

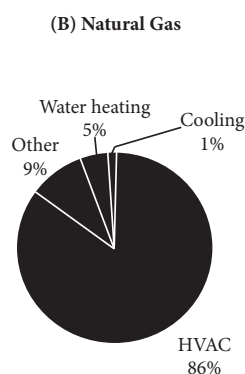
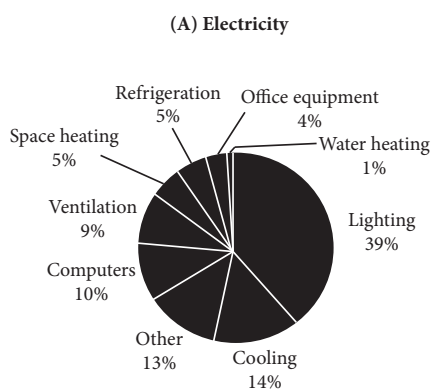
21

Which choice provides the most accurate interpretation of the data in the chart?

- A) NO CHANGE
- B) less electricity and natural-gas usage than does office equipment.
- C) more natural-gas usage than do all other appliances and services.
- D) more electricity usage than do office computers.

Office buildings' energy consumption by end use in the U.S.

Data from the U.S. Energy Information Administration show that cooling, lighting, and ventilation account for 62 percent of electricity use (A), and HVAC dominates natural gas use at 86 percent in (B).



Note: Insufficient data were available for electric consumption of cooking equipment; sum may not total 100% due to rounding.

© E Source: Data from the U.S. Energy Information Administration

As American businesses move towards maximizing the productivity of the work environment and reducing losses from unnecessary and costly office expenditures, **22** it is likely that the temperature will remain cold so that employees stay awake.

22

The writer wants a conclusion that addresses the future of efforts to decrease workplace expenditures and agrees with the main idea of the passage. Which choice results in the passage having the most appropriate concluding sentence?

- A) NO CHANGE
- B) there is likely to be increased polling as to what it is about offices that bothers employees the most.
- C) office lunches, coffee, and snacks are likely to disappear.
- D) it is likely that there will be a warming up of offices all around.

Questions 22–33 are based on the following passage.

Driverless Car, Meet Operator-less Elevator

Google has been busily testing its “driverless cars” for the last three years, promising a release date within a matter of years. While Americans seem interested, they do not seem fully convinced regarding the technology just yet. What if the car crashes? What if it spins out of control? Won’t a human driver be able to adapt to conditions better than a computer will?

Google is taking these questions very seriously. Luckily, **23** they’re able to learn from history. “How is it possible,” the Google executives wonder, “to make people comfortable with automated, interactive technology—especially when it comes to their safety?” This question is at least 115 years old. It was also posed when the automated elevator was invented in **24** 1900, at the turn of the last century.

The first safety-elevator, **25** the best elevator anyone had seen to that point, was installed at 488 Broadway in New York City in 1857. Before that time, elevators were operated by elevator operators. These were men, and later women, who controlled all elevator **26** functions: these operators opened and closed the doors and guided the elevator to level stops by hand.

23

- A) NO CHANGE
- B) their
- C) its
- D) it’s

24

- A) NO CHANGE
- B) 1900.
- C) 1900—at the turn of the last century.
- D) 1900, the beginning of the last century.

25

Which choice provides the most specific information on the safety of the elevator?

- A) NO CHANGE
- B) the precursor to the automated elevator in a building near you,
- C) so-called because the cab would not fall in the event of a broken cable,
- D) although not the first elevator in widespread use in the United States,

26

- A) NO CHANGE
- B) functions and these
- C) functions these
- D) functions, these

By 1900, several completely automated elevators were installed in various commercial buildings in New York City. **27** Although the automated elevator seemed like a guaranteed success, the public loathed and feared the new technology. People feared that, in the absence of an operator, the elevator would plummet to the floor and kill everyone inside. Many refused to ride such elevators, and the buildings that had installed them quickly returned to the practice of manual elevator operation.

28 Soon, the government would have to intervene. That year, a strike of fifteen thousand workers in commercial trades, including elevator operators, doormen, porters, firemen, and maintenance workers, brought the main business districts of New York to a halt, leaving 1.5 million people unable to get to work. No one was manning the elevators, and **29** upwards to 8 million dollars in federal taxes were lost per day. As a result, and in order to remove such power from any future strikes, the elevator industry dedicated itself to reintroducing the American public to the automated elevator. Demonstrating how safe and enjoyable the experience could be, the industry ran ads for the next few years featuring children pushing buttons in elevators and asking to ride again. **30** People also began to see more and more elevators without operators.

27

- A) NO CHANGE
- B) Given that
- C) Since
- D) DELETE the underlined portion and begin the sentence with a capital letter.

28

Which choice most effectively sets up the paragraph?

- A) NO CHANGE
- B) All of this changed in 1945.
- C) But eventually people came around.
- D) Elevators as we know them today are not new.

29

- A) NO CHANGE
- B) from
- C) as much as
- D) an amount approximating

30

Which choice gives an additional supporting example that emphasizes the importance of lessening public fear towards automated elevators?

- A) NO CHANGE
- B) Miniature cabs and shafts were set up at state fairs for people to ride and control, without the fear of harm from riding in tall office buildings.
- C) People would eventually become very comfortable with the idea of automated airline flights.
- D) Eventually over time the ads began to work, and people began to ride the elevators more.

Google is paying close attention to the elevator **31** industries experience, and it is demonstrating that attention in a number of creative ways. **32** For example, Google believes, as the elevator industry did many years earlier, that publicizing the production and testing process will create a sense of normalcy around the product before it is even introduced. Only time will tell how well these techniques will work, **33** and whether the nervous public will be willing to accept them.

31

- A) NO CHANGE
- B) industries'
- C) industry's
- D) industrys

32

- A) NO CHANGE
- B) However,
- C) For all that,
- D) Surprisingly,

33

The writer wants to conclude the paragraph effectively while also reinforcing the point that skepticism toward driverless cars exists. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) and if driverless cars become more heavily used than elevators.
- C) or if the whole plan was doomed from the start.
- D) but industry experts say it could take a decade before the cars are ready to use.

Questions 34–44 are based on the following passage.

Toxic Snail Kills the Pain

The *Conus magus* is a predatory and venomous marine snail that is protected by a beautiful shell; 34 their name translates to “magical cone.” The shell size of an adult ranges from 16 mm to 94 mm, or from a half inch to three inches long. The shell resembles striped chocolate or chestnut coloring on white. The *Conus magus* is found in many parts of the globe—including the Red Sea, the Indian Ocean, the Mascarene Basin, and parts of the Pacific.

35 While the *Conus magus* is a fascinating species in its own right, humans are primarily interested in one aspect of the species: the medicinal qualities of its venom. The venom of the *Conus magus* contains conotoxins, a group of neurotoxic peptides, specific to this species of snail. The majority of these peptides are lethal to humans, 36 and one is highly beneficial. Scientists have developed ziconotide, a synthetic chemical, from one of these singular neurotoxic peptides. 37 It is one of the most highly effective pain-killers known to man; its potency is 1000 times that of morphine. Ziconotide works by blocking calcium channels, which are located in pain-transmitting nerve cells within the 38 brain, heart, the nervous system, and bone. This blockage prevents the calcium channels from transmitting pain signals to the brain.

34

- A) NO CHANGE
- B) its
- C) it's
- D) his

35

- A) NO CHANGE
- B) Because
- C) Since
- D) In that

36

- A) NO CHANGE
- B) yet
- C) so
- D) for

37

- A) NO CHANGE
- B) This synthetic chemical, ziconotide,
- C) Ziconotide
- D) This

38

- A) NO CHANGE
- B) brain, heart, nervous, system,
- C) brain, heart, nervous, system
- D) brain, heart, nervous system,

In 2004, the U.S. Food and Drug Administration **39** approved the use of Prialt, the ziconotide from snail toxin, as a prescribed painkiller. Prialt has not gained the widespread use of morphine and other less potent painkillers, **40** because of its remarkable effectiveness. This is largely due to the fact that Prialt is difficult to administer. The only way to administer the drug is to **41** have injected it into the spine, a very painful procedure. Largely due to this difficulty, Prialt has only been used to treat chronic and severe pain caused by such diseases as AIDS, cancer, and neurological disorders.

39

- A) NO CHANGE
- B) put its stamp of approval on
- C) provided official sanction for
- D) gave the thumbs up and “O.K.” to

40

- A) NO CHANGE
- B) since
- C) despite
- D) therefore

41

- A) NO CHANGE
- B) inject
- C) injected
- D) injecting

(1) Prialt has to be injected because it cannot cross the blood-brain barrier, **42** a sort of membrane that blocks compounds within the blood from entering the brain. (2) However, in the last year, scientists have been working on a way to administer Prialt in a less painful way. (3) One proposed delivery solution is hiding Prialt in something that can cross the blood-brain barrier. (4) Referred to as the “Trojan Horse strategy,” the process places the chemical inside a tiny container constructed from viral proteins. **43**

Although still in the research phase, this **44** solution could be the key to widespread Prialt use. If this delivery method works it could lead to a vast reduction of untreated pain for long-suffering patients.

42

The writer is considering deleting the underlined portion (ending the sentence with a period). Should the writer make this deletion?

- A) Yes, because the underlined portion detracts from the paragraph’s focus why Prialt must be injected.
- B) Yes, because the information in the underlined portion is provided earlier in the sentence.
- C) No, because the underlined portion defines a term that is important to the passage.
- D) No, because the underlined portion gives an example of a particular kind of blood-brain barrier.

43

The writer plans to add the following sentence to this paragraph.

This carrier would then transport the chemical to the desired location in the brain.

To make this paragraph most logical, the sentence should be placed

- A) after sentence 1.
- B) after sentence 2.
- C) after sentence 3.
- D) after sentence 4.

44

- A) NO CHANGE
- B) resolution would
- C) solution would
- D) resolution could

No Test Material On This Page



Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

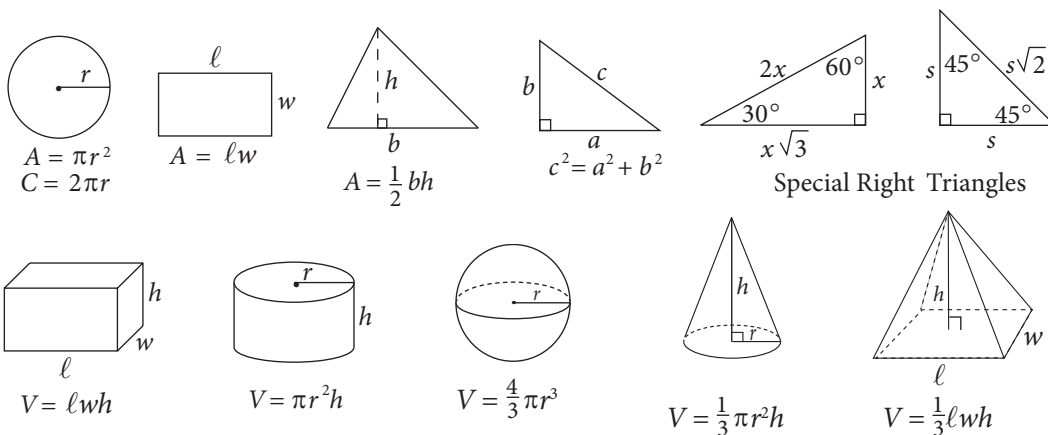
DIRECTIONS

For questions **1-15**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. For questions **16-20**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

NOTES

1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.



1

If $17 = 3 + 8x$, what is the value of $4x + 9$?

- A) 7
- B) 14
- C) 16
- D) 25

2

Meteorologists in Atlanta have developed the following equation to estimate the temperature t , in degrees Fahrenheit, based on the number of hours h after sunrise until 4:00 P.M.:

$$t = 5h + 61.4$$

According to this model, by how many degrees Fahrenheit will the temperature rise each hour until 4:00 P.M.?

- A) 3.3
- B) 5
- C) 12.3
- D) 30.7

3

$$H = 35 - 4t$$

Every day, Lee, a home inspector, is assigned a group of houses needing to be inspected. Lee uses the model above to estimate how many houses he has left to inspect at the end of each hour, where H is the number of houses he has left to inspect and t is the number of hours he has worked so far that day. What does the value 4 represent in this model?

- A) The number of hours Lee has to finish all of his assigned houses.
- B) The number of houses that Lee has already inspected that day.
- C) The number of total houses assigned to Lee to complete that day.
- D) The rate at which Lee inspects houses.

4

If $y = 4(3x - 1)(5x - 1)$ then which of the following is equal to y ?

- A) $40x$
- B) $60x^2 + 4$
- C) $60x^2 - 32x + 4$
- D) $45x^2 + 8$



5

If $\frac{7}{2x-30} = \frac{2}{x}$, then what is the value of $\frac{x}{2}$?

- A) -20
- B) -10
- C) 10
- D) 15

6

If $4 = \frac{y+7}{y-7}$, then $y =$

- A) $\frac{5}{21}$
- B) $\frac{21}{5}$
- C) 7
- D) $\frac{35}{3}$

7

Line l passes through the points (1, 3) and (2, 5), and line m passes through point (1, 4) and has a slope of 1. If lines l and m intersect at point (a, b) , then what is the value of $a - b$?

- A) -3
- B) 2
- C) 5
- D) 7

8

In the xy -plane, the parabola with the equation $y = (x + 4)^2$ intersects the line $y = 36$ at two points. What is the distance between those two points of intersection?

- A) 6
- B) 8
- C) 10
- D) 12



9

$$f(x) = -2x^2 + c$$

In the function f above, c is a constant and $f(2) = 6$. What is the value of $f(-2)$?

- A) -6
- B) 0
- C) 6
- D) 10

11

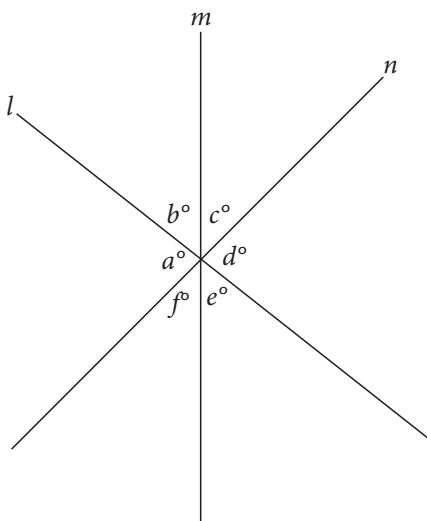
$$M = 1.35 + 0.75y$$

$$T = 2.25 + 0.60y$$

The equations above represent the average price, in dollars, of a cup of coffee in Montreal and Toronto, represented by M and T , respectively, y years after 2000. What was the average price of a cup of coffee, in dollars, in Toronto when it was equal to the average price of a cup of coffee in Montreal?

- A) 5.85
- B) 6.00
- C) 6.45
- D) 6.60

10



Note: Figure not drawn to scale.

In the figure above, lines l , m , and n intersect at a point. If $a + c = b + d$, then which of the following could be FALSE?

- A) $b = c$
- B) $e = f$
- C) $c = f$
- D) $a = b$

12

$$y = a(x + 6)(x - 2)$$

In the quadratic equation above, a is a nonzero constant. The graph of the equation in the xy -plane is a parabola with a vertex of (h, k) . Which of the following is equivalent to k ?

- A) 0
- B) $-4a$
- C) $-12a$
- D) $-16a$



13

A line in the xy -plane passes through the origin and has a slope of 6. Which of the following points lies on the line?

- A) $(0, 6)$
- B) $(\frac{1}{3}, 2)$
- C) $(6, 0)$
- D) $(6, 1)$

14

If $a > 5$, which of the following is equivalent to

$$\frac{1}{\frac{1}{a+5} + \frac{1}{a+4}}?$$

- A) $2a + 9$
- B) $\frac{2a+9}{a^2+9a+20}$
- C) $a^2+9a+20$
- D) $\frac{a^2+9a+20}{2a+9}$

15

$$x^2 + \frac{1}{2}r = -\frac{q}{3}x$$

In the quadratic equation above, q and r are constants. What are the solutions for x ?

- A) $-\frac{q}{6} \pm \frac{\sqrt{q^2-18r}}{6}$
- B) $-\frac{q}{6} \pm \frac{\sqrt{q^2-2r}}{6}$
- C) $-\frac{q}{3} \pm \frac{\sqrt{q^2-18r}}{3}$
- D) $-\frac{q}{3} \pm \frac{\sqrt{q^2-2r}}{3}$

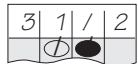


DIRECTIONS

For questions 16-20, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
- Mark no more than one circle in any column.
- No question has a negative answer.
- Some problems may have more than one correct answer. In such cases, grid only one answer.

- Mixed numbers** such as $3\frac{1}{2}$ must be gridded

as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not as $3\frac{1}{2}$.)

- Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.

Answer: $\frac{7}{12}$

Write answer in boxes. →

7	/	1	2
.	.	.	.
0	0	0	0
1	1	2	1
2	2	2	1
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Grid in result. →

← Fraction line

Answer: 2.5

2	.	5
.	.	.
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

← Decimal point

Acceptable ways to grid $\frac{2}{3}$ are:

2	/	3
.	.	.
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

.	6	6	6
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

.	6	6	7
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Answer: 201 – either position is correct

2	0	1
.	.	.
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

2	0	1
.	.	.
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

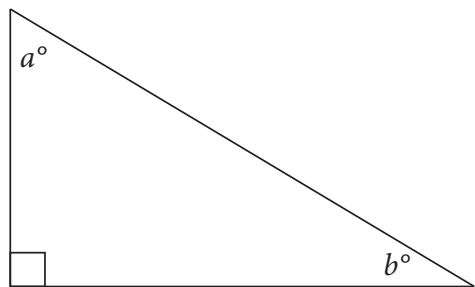
NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.



16

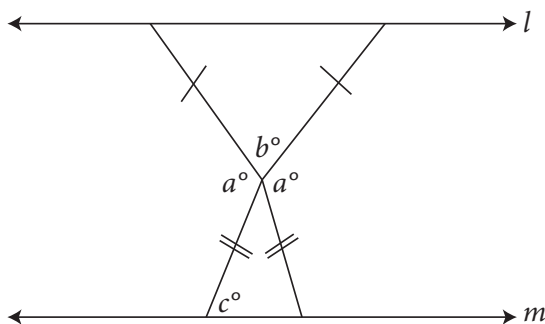
If $x > 0$ and $x^2 - 25 = 0$, what is the value of x ?

17



In the figure above, $\cos a^\circ = \frac{5}{13}$. What is $\sin b^\circ$?

18



Note: Figure not drawn to scale.

In the figure above, lines l and m are parallel, $180 - 2c = b$, and $c = 65$. What is the value of a ?

19

$$\begin{aligned} a + 3b &= -10 \\ a + b &= -2 \end{aligned}$$

In the system of equations above, what is the value of a ?



20

$$2x + 8y = 74$$

$$3x - 4y = 43$$

If (x, y) is the solution to the system of equations shown above, then what is the value of y ?

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



Math Test – Calculator

55 MINUTES, 38 QUESTIONS

Turn to Section 4 of your answer sheet to answer the questions in this section.

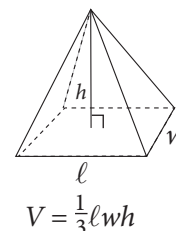
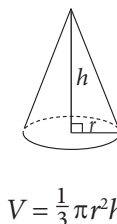
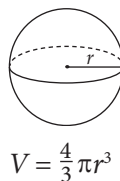
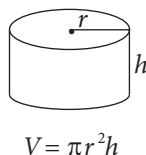
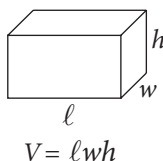
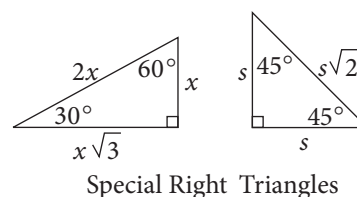
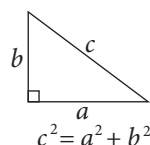
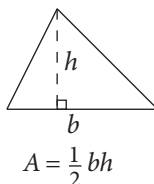
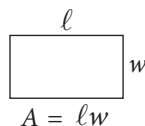
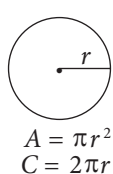
DIRECTIONS

For questions **1–30**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. For questions **31–38**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 31 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

NOTES

1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



The number of degrees of arc in a circle is 360.

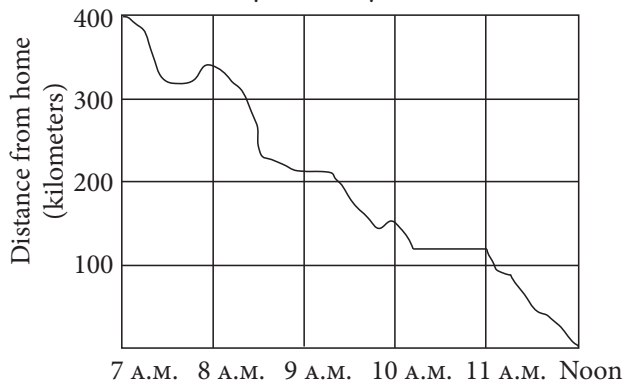
The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.



1

Casey's Motorcycle Ride



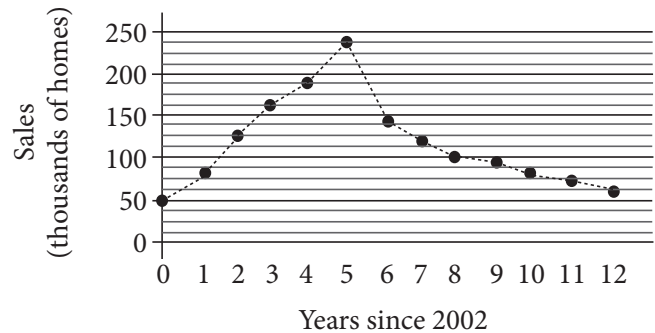
The graph above shows Casey's distance from home on the second day of a two-day motorcycle trip. During her 5-hour ride home, she stops for 45 minutes for breakfast. Based on the graph, which of the following is closest to the time she stopped for breakfast?

- A) 7:00 A.M.
- B) 8:30 A.M.
- C) 10:15 A.M.
- D) 11:00 A.M.

2

The graph below shows the total number of home sales, in thousands, each year from 2002 through 2014.

Annual Home Sales

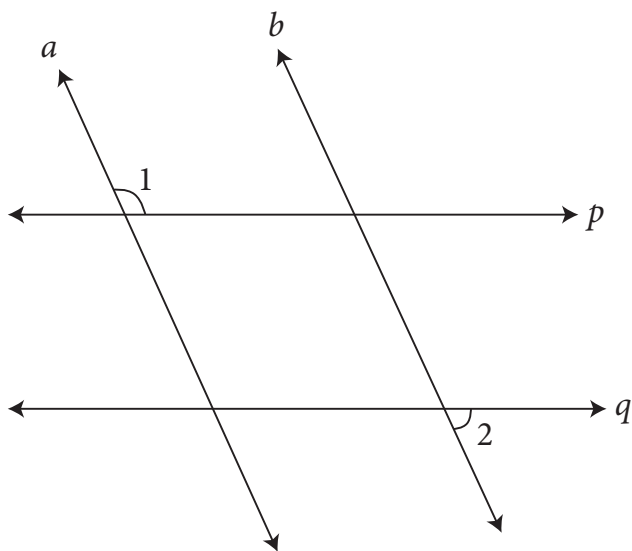


Based on the graph, which of the following best describes the general trend in home sales from 2002 to 2014?

- A) Sales decreased until 2007 and then increased.
- B) Sales increased until 2007 and then decreased.
- C) Sales generally remained steady from 2002 until 2014
- D) Sales decreased and increased in a repeating pattern.



3



In the figure above, lines a and b are parallel and lines p and q are parallel. If the measure of $\angle 1$ is 135° , what is the measure of $\angle 2$?

- A) 45°
- B) 105°
- C) 120°
- D) 135°

4

x	1	2	3	4
$g(x)$	1	4	7	10

The table above shows some values for the linear function g . Which of the following defines g ?

- A) $g(x) = 2x - 1$
- B) $g(x) = 3x - 2$
- C) $g(x) = 4x - 3$
- D) $g(x) = 5x - 4$

5

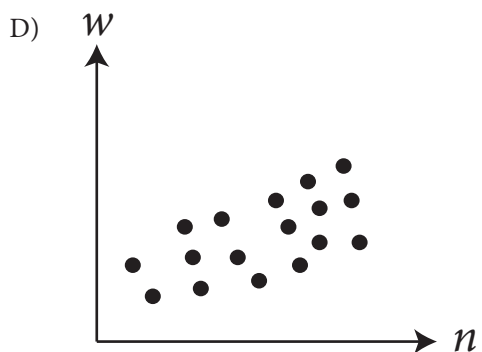
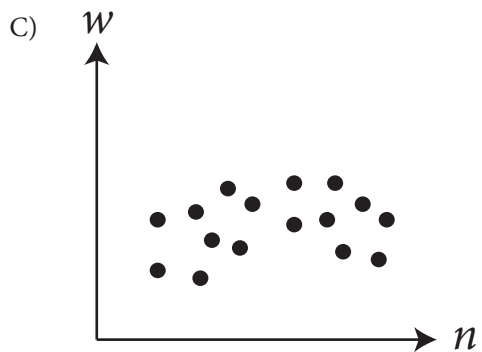
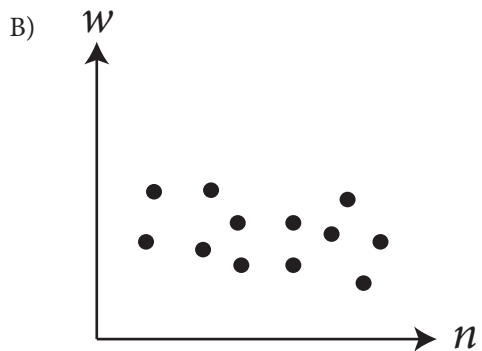
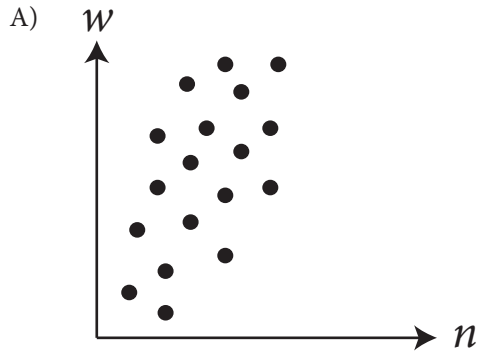
The luminosity, L , of a star is determined by the formula $L = 4\pi d^2 b$, where d represents the distance of the star in meters and b represents the brightness of the star in watts per meter squared. Which of the following equations determines the distance of a star in terms of its luminosity and brightness?

- A) $d = \sqrt{\frac{L}{4\pi b}}$
- B) $d = L\sqrt{4\pi b}$
- C) $d = \sqrt{\frac{Lb}{4\pi}}$
- D) $d = 4\pi\sqrt{\frac{L}{b}}$



6

Which of the following graphs best shows a weak positive association between n and w ?



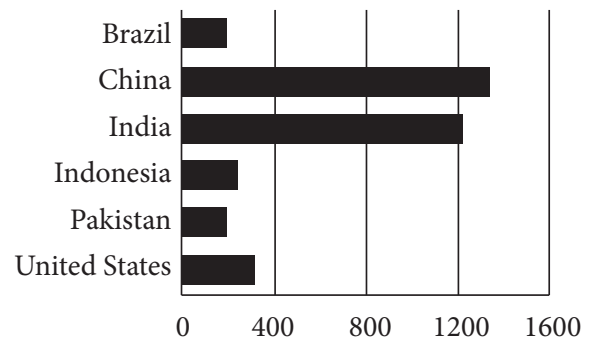
7

Last week Salazar played 13 more tennis games than Perry. If they played a combined total of 53 games, how many games did Salazar play?

- A) 20
- B) 27
- C) 33
- D) 40

8.

Populations of the six most populous countries, 2015



The populations of the six most populous countries in the world in 2015 are shown in the graph above. If the total population of the six countries shown is 3,489,000,000, what is an appropriate label for the horizontal axis?

- A) Population (in billions of people)
- B) Population (in millions of people)
- C) Population (in thousands of people)
- D) Population



9

Line l has a slope of m and contains points in quadrants I, II, and IV, but no points from quadrant III. Which of the following must be true about the value of m ?

- A) $m < 0$
- B) $m > 0$
- C) $m = 0$
- D) Slope m is undefined.

10

The amount of money, D , in dollars, remaining in Kabir's bank account x days after payday can be modeled by the equation $D = 2,314.05 - 165.29x$. Which of the following best describes the meaning of the number 165.29 in the equation?

- A) The amount of money withdrawn from Kabir's bank account each day.
- B) The amount of money Kabir gets paid each payday.
- C) The difference between the amount of money in Kabir's bank account at payday and the amount of money in Kabir's bank account on day x .
- D) The number of days after payday when no money remains in Kabir's bank account.

11

Function f satisfies $f(4) = 6$ and $f(6) = 5$, and function g satisfies $g(5) = 7$ and $g(6) = 4$. What is the value of $g(f(6))$?

- A) 4
- B) 5
- C) 6
- D) 7



Questions 12 and 13 refer to the following information.

Interface	Coefficient of friction (μ)
skin – metals	0.90
wood – concrete	0.62
wood – brick	0.60
wood – metals	0.40
wood – stone	0.30
wood – felt	0.29
wood – wood	0.28

The chart above shows approximate values for the coefficient of friction, μ , for various combinations of materials. The friction between two objects can be given by the equation $f = \mu N$, where f is friction measured in Newtons, μ is the coefficient of friction, a dimensionless scalar value dependent on the materials used and expressing the ratio between the friction between the two bodies and the force pressing the two bodies together, and N is the force pressing the two bodies together, in Newtons.

13

The force pressing two stacked objects together is equal to the weight of the object on top. The friction between a piece of wood on a stone surface is 22.5 Newtons. The same piece of wood is placed on another surface, and the friction between the wood and the surface is now 46.5 Newtons. What could be the second surface?

- A) metal
- B) concrete
- C) brick
- D) skin

12

Approximately what is the friction, in Newtons, between two pieces of wood being pressed together with a force of 30 Newtons?

- A) 8.4
- B) 18.6
- C) 33.3
- D) 107.1



14

$$\left(1 + \frac{0.05}{n}\right)^n - 1$$

The expression above gives the effective annual interest rate on a bank account that pays an annual interest rate of 5%, compounded n times per year. Which of the following expressions shows the change in the effective rate on the bank account if the interest is compounded monthly rather than if the interest is compounded quarterly?

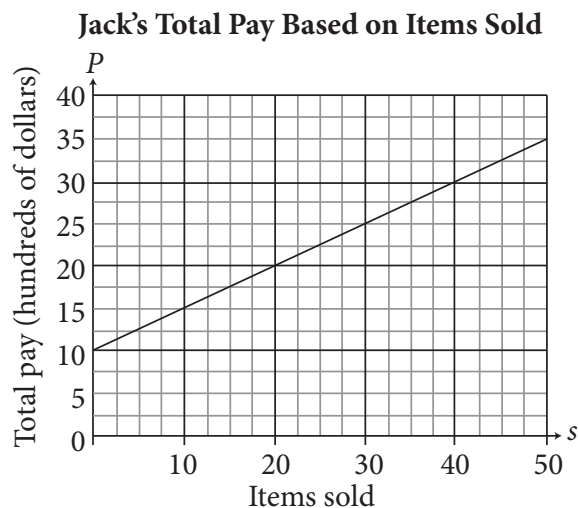
A) $\left[\left(1 + \frac{0.05}{12}\right)^{12} - 1\right] - \left[\left(1 + \frac{0.05}{4}\right)^4 - 1\right]$

B) $\frac{\left(1 + \frac{0.05}{12}\right)^{12} - 1}{\left(1 + \frac{0.05}{4}\right)^4 - 1}$

C) $\left(1 + \frac{0.05}{\frac{12}{4}}\right)^{\frac{12}{4}} - 1$

D) $\left(1 + \frac{0.05}{12 - 4}\right)^{12 - 4} - 1$

Questions 15 and 16 refer to the following information.



The graph above displays the total amount of pay, P , in hundreds of dollars, Jack earns for the sale of s items.

15

What does the P -intercept represent in the graph?

- A) The total number of items Jack sells
- B) Jack's base pay
- C) The total number of items available for sale
- D) The increase in pay Jack receives for each item sold



16

Which of the following represents the relationship between s and P ?

- A) $s = 2P$
 - B) $P = 10s$
 - C) $P = \frac{3}{2}s + 10$
 - D) $P = \frac{1}{2}s + 10$
-

17

The cost of renting a car at an airport rental company is \$25.50 per day. Which of the following equations represents the total cost d , in dollars, for w weeks of car rental?

- A) $d = \frac{25.50}{7w}$
- B) $d = \frac{25.50w}{7}$
- C) $d = 25.50(7w)$
- D) $d = 25.50w + 7$

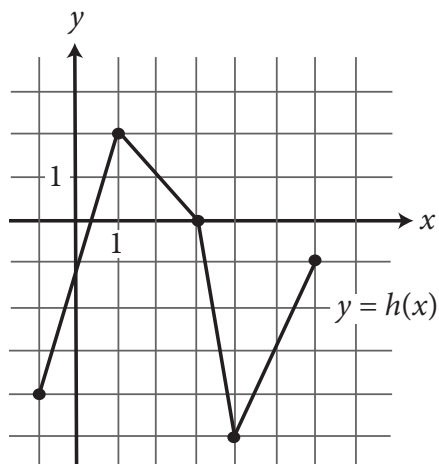
18

In order to determine if engine oil E will improve gas mileage, a research study was conducted. From a wide range of vehicle makes, models, and model years, 400 vehicles were randomly selected. Half of the vehicles were chosen at random to receive oil E , and the other half received a generic brand of oil. The resulting data showed that vehicles that received engine oil E had substantial improvements in gas mileage as compared to those that received the generic brand of engine oil. Which of the following can best be concluded based on the design and results of the research?

- A) Engine oil E improves gas mileage better than any other available engine oil.
- B) Engine oil E will cause a significant improvement in gas mileage.
- C) Engine oil E will improve the gas mileage of any vehicle that uses it.
- D) Engine oil E is likely to improve the gas mileage of cars that use it.



19



The complete graph of the function h is shown in the xy -plane above. For what value of x is $h(x)$ at its maximum?

- A) 1
- B) 2
- C) 3
- D) 4

20

According to the U. S. Census Bureau, in the United States in 2012 the median household income was \$51,017, and the average (arithmetic mean) household income was \$71,274. Which of the following best explains the difference between the median and average household incomes in the United States in 2012?

- A) Different households have greatly varying incomes in the United States.
- B) Some households in the United States had incomes much greater than the rest.
- C) Many households in the United States had incomes between \$51,017 and \$71,274.
- D) Some households in the United States had incomes much less than the rest.

21

If $2x - 3 \leq 5$, what is the greatest possible value of $2x + 3$?

- A) 4
- B) 8
- C) 10
- D) 11



Questions 22 and 23 refer to the following information.

$$E = \frac{q}{4\pi\epsilon_0 R^2}$$

The electric field strength E at distance R from a single point charge in a vacuum is related to the value of charge q and the electric constant ϵ_0 by the equation above.

22

Which of the following expresses the electric constant in terms of the electric field strength, the value of the charge, and the square of the distance from the charge?

- A) $\epsilon_0 = \frac{q}{4\pi R^2 E}$
- B) $\epsilon_0 = \frac{E}{4\pi R^2 q}$
- C) $\epsilon_0 = \frac{qE}{4\pi R^2}$
- D) $\epsilon_0 = \frac{4\pi R^2 E}{q}$

23

For the same charge q , the electric field strength measured at point X is $\frac{1}{25}$ the electric field measured at point Y. The distance of point X from the charge is how many times the distance of point Y from the charge?

- A) $\frac{1}{5}$
- B) 5
- C) 25
- D) 125

24

If point $O(5, 0)$ is at the center of a circle that contains point $P\left(6, \frac{12}{5}\right)$ on its circumference, which of the following is the equation of circle O in the xy -plane?

- A) $(x - 5)^2 + y^2 = \frac{13}{5}$
- B) $(x + 5)^2 + y^2 = \frac{5}{13}$
- C) $(x - 5)^2 + y^2 = \frac{169}{25}$
- D) $(x + 5)^2 + y^2 = \frac{169}{25}$

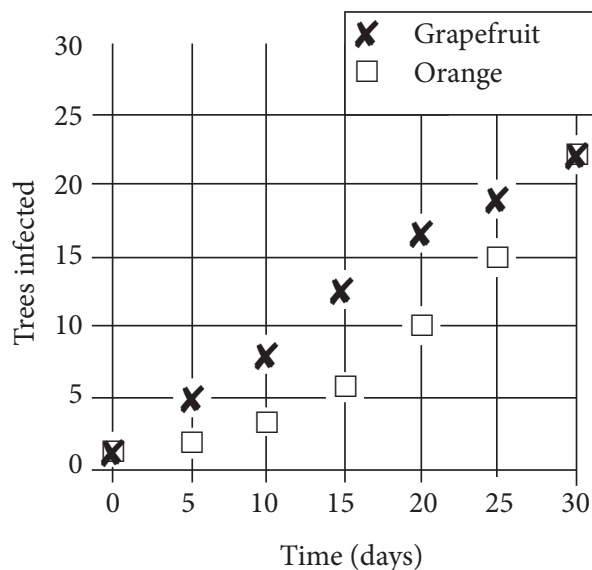


25

Charles is a chemist studying the reaction that produces methyl alcohol under high pressure. He noticed that the actual yield of methyl alcohol from solution *S* was 25% less than the actual yield from solution *T*. Based on Charles's observation, if solution *S* produced 120 grams of methyl alcohol, how many grams of methyl alcohol did solution *T* produce?

- A) 40
- B) 90
- C) 145
- D) 160

26



Two populations of citrus fruit trees growing in greenhouses are exposed to citrus bacterial canker (CBC) by introducing one infected tree to each population. One population consists of 100 mature orange trees, and the other population consists of 100 mature grapefruit trees. The populations are then left for 30 days. The graph above shows the number of infected trees at 5-day intervals. Which of the following statements correctly compares the average rates at which the two populations become infected with CBC?

- A) In every 5-day interval, the magnitude of the rate of infection of the grapefruit tree population is greater than that of the orange tree population.
- B) In every 5-day interval, the magnitude of the rate of infection of the orange tree population is greater than that of the grapefruit tree population.
- C) In the intervals from 0 to 5 days and from 5 to 10 days, the rates of infection of the grapefruit trees are of greater magnitude, whereas in the intervals from 20 to 25 days and from 25 to 30 days, the rates of infection of the orange trees are of greater magnitude.
- D) In the intervals from 0 to 5 days and from 5 to 10 days, the rates of infection of the orange trees are of greater magnitude, whereas in the intervals from 20 to 25 days and from 25 to 30 days, the rates of infection of the grapefruit trees are of greater magnitude.

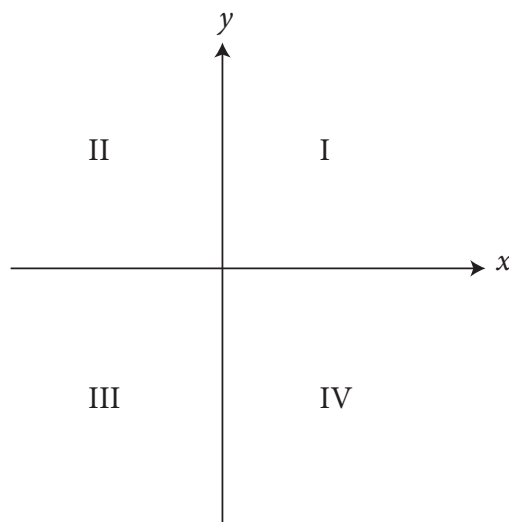


27

The return on investment of a certain company's stock has been modeled with the equation $I = \frac{PT}{\sqrt{1+R}}$ where I is the percent increase in the stock's value, P is the company's annual profits, T is time invested in years, and R is the relative risk rating. Which of the following expressions can be used to determine the relative risk rating of this company's stock?

- A) $R = 1 + \left(\frac{PT}{I}\right)^2$
 B) $R = \frac{(PT)^2}{I^2 - 1}$
 C) $R = \left(\frac{PT}{I}\right)^2 - 1$
 D) $R = \frac{PT}{I^2} - 1$

28



$$y \geq \frac{x}{2} - 5$$

$$y < 3x - 2$$

If the above system of inequalities is graphed in the xy -plane, which quadrant contains no solutions to the system?

- A) Quadrant II
 B) Quadrant III
 C) Quadrant IV
 D) There are solutions in all four quadrants.



29

$$f(x) = ax^3 + bx^2 + cx + d$$

In the polynomial above, a , b , c , and d are constants. If $f(-5) = 3$, which of the following must be true about $f(x)$?

- A) $x - 3$ is a factor of $f(x)$.
- B) The remainder when $f(x)$ is divided by $x + 5$ is 3.
- C) $x + 2$ is a factor of $f(x)$.
- D) $x + 5$ is a factor of $f(x)$.

30

$$y = cx^2 + d$$

$$2y = 10$$

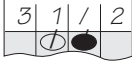
In the system of equations above, c and d are constants. For which of the following values of c and d does the system of equations have no real solutions?

- A) $c = -6$, $d = 6$
- B) $c = -5$, $d = 4$
- C) $c = 6$, $d = 4$
- D) $c = 6$, $d = 5$



DIRECTIONS

For questions 31-38, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
- Mark no more than one circle in any column.
- No question has a negative answer.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not as $3\frac{1}{2}$.)
- Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.

Answer: $\frac{7}{12}$

Write answer in boxes. →

7	/	1	2
.	.	.	.
1	0	0	0
2	1	0	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

Grid in result. →

← Fraction line

Answer: 2.5

	2	.	5
.	.	.	.
1	0	0	0
2	1	0	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

← Decimal point

Acceptable ways to grid $\frac{2}{3}$ are:

	2	/	3
.	.	.	.
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

.	6	6	6
.	.	.	.
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

.	6	6	7
.	.	.	.
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

Answer: 201 – either position is correct

	2	0	1
.	.	.	.
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

2	0	1	
.	.	.	.
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.



31

At a certain restaurant, milkshakes cost \$4 and cheeseburgers cost \$6. If Al buys 1 milkshake and x cheeseburgers and spends at least \$30 but no more than \$46, what is one value of x ?

32

A bowl with 300 milliliters of water is placed under a hole where the rain gets in. If water drips into the bowl at a rate of 7 milliliters per minute, then how many milliliters of water will be in the bowl after 50 minutes?

33

Age of the first fourteen Indian Prime Ministers upon taking office

Prime Minister	Age (years)	Prime Minister	Age (years)
Jawaharlal Nehru	57	V. P. Singh	58
Lal Bahadur Shastri	59	Chandra Shekhar	63
Gulzarilal Nanda	65	P. V. Narasimha Rao	69
Indira Gandhi	48	Atal Bihari Vajpayee	71
Morarji Desai	81	H. D. Deve Gowda	63
Charan Singh	76	I. K. Gujral	77
Rajiv Gandhi	40	Manmohan Singh	71

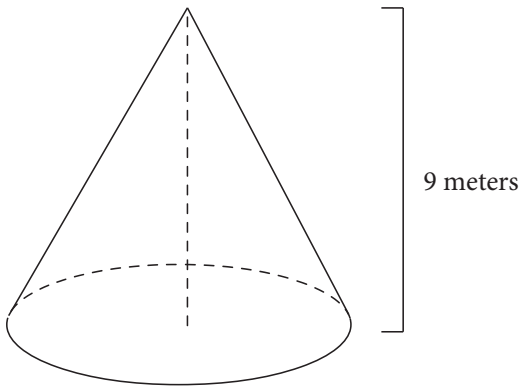
The table above shows the ages of the first 14 Indian prime ministers when they began terms in office. According to the table, what is the mean age, in years, of these prime ministers at the beginning of their terms? (Round your answer to the nearest tenth.)



34

In one month, Rama and Siham ran for a total of 670 minutes. If Rama spent 60 fewer minutes running than Siham did, for how many minutes did Siham run?

35



A state highway department uses a salt storage enclosure that is in the shape of a cone, as shown above. If the volume of the storage enclosure is $48\pi \text{ m}^3$, then what is the diameter of the base of the cone, in meters?

36

$$f(x) = \frac{1}{(x-12)^2 + 14(x-12) + 49}$$

For what value of x is the function f above undefined?



Questions 37 and 38 refer to the following information.

Marginal cost is the increase or decrease in the total cost a business will incur by producing one more unit of a product or serving one more customer. Marginal cost can be calculated using the equation $M = \frac{C_2 - C_1}{Q_2 - Q_1}$, where M is the marginal cost, C_1 is the total cost for Q_1 units, and C_2 is the total cost for Q_2 units.

At Carol's Steakhouse, the total cost of serving 150 customers per day is \$900. Carol is interested in increasing her business, but is concerned about the effect on marginal cost.

37

Carol calculates that the total cost of serving 200 customers per day would be \$1,600. What is the marginal cost of this increase in customers?

38

Carol successfully increases her business to 200 customers per day. However, her total cost for doing so is 50% greater than the expected \$1,600. What percent greater is the actual marginal cost than the expected marginal cost, to the nearest full percent? (Note: Ignore the percent sign when entering your answer. For example, if your answer is 326%, enter 326.)

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



No Test Material On This Page

SAT Essay

ESSAY BOOK

DIRECTIONS

The essay gives you an opportunity to show how effectively you can read and comprehend a passage and write an essay analyzing the passage. In your essay you should demonstrate that you have read the passage carefully, present a clear and logical analysis, and use language precisely.

Your essay must be written on the lines provided in your answer sheet booklet; except for the planning page of the answer booklet, you will receive no other paper on which to write. You will have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.

You have 50 minutes to read the passage and write an essay in response to the prompt provided inside this booklet.

REMINDER

- Do not write your essay in this booklet. Only what you write on the lined pages of your answer booklet will be evaluated.
- An off-topic essay will not be evaluated.

As you read the passage below, consider how President Lincoln uses

- evidence, such as facts or examples, to support claims.
- reasoning to develop ideas and to connect claims and evidence.
- stylistic or persuasive elements, such as word choice or appeals to emotion, to add power to the ideas expressed.

Abraham Lincoln’s Second Inaugural Address was given in Washington, D.C. on March 4, 1865, one month before the end of the Civil War.

1 *Fellow-Countrymen:*

- 2 At this second appearing to take the oath of the Presidential office there is less occasion for an extended address than there was at the first. Then a statement somewhat in detail of a course to be pursued seemed fitting and proper. Now, at the expiration of four years, during which public declarations have been constantly called forth on every point and phase of the great contest which still absorbs the attention and engrosses the energies of the nation, little that is new could be presented. The progress of our arms, upon which all else chiefly depends, is as well known to the public as to myself, and it is, I trust, reasonably satisfactory and encouraging to all. With high hope for the future, no prediction in regard to it is ventured.
- 3 On the occasion corresponding to this four years ago all thoughts were anxiously directed to an impending civil war. All dreaded it, all sought to avert it. While the inaugural address was being delivered from this place, devoted altogether to *saving* the Union without war, insurgent agents were in the city seeking to *destroy* it without war—seeking to dissolve the Union and divide effects by negotiation. Both parties deprecated war, but one of them would *make* war rather than let the nation survive, and the other would *accept* war rather than let it perish, and the war came.
- 4 One-eighth of the whole population were colored slaves, not distributed generally over the Union, but localized in the southern part of it. These slaves constituted a peculiar and powerful interest. All knew that this interest was somehow the cause of the war. To strengthen, perpetuate, and extend this interest was the object for which the insurgents would rend the Union even by war, while the Government claimed no right to do more than to restrict the territorial enlargement of it. Neither party expected for the war the magnitude or the duration which it has already attained. Neither anticipated that the *cause* of the conflict might cease with or even before the conflict itself should cease. Each looked for an easier triumph, and a result less fundamental and astounding. Both read the same Bible and pray to the same God, and each invokes His aid against the other. It may seem strange that any men should dare to ask a just God’s assistance in wringing their bread from the sweat of other men’s faces, but let us judge not, that we be not judged. The prayers of both could not be answered. That of neither has been answered fully. The Almighty has His own purposes. “Woe unto the world because of offenses; for it must needs be that offenses come, but woe to that man by whom the offense cometh.” If we shall suppose that American slavery is one

of those offenses which, in the providence of God, must needs come, but which, having continued through His appointed time, He now wills to remove, and that He gives to both North and South this terrible war as the woe due to those by whom the offense came, shall we discern therein any departure from those divine attributes which the believers in a living God always ascribe to Him? Fondly do we hope, fervently do we pray, that this mighty scourge of war may speedily pass away. Yet, if God wills that it continue until all the wealth piled by the bondsman's two hundred and fifty years of unrequited toil shall be sunk, and until every drop of blood drawn with the lash shall be paid by another drawn with the sword, as was said three thousand years ago, so still it must be said "the judgments of the Lord are true and righteous altogether."

- 5 With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us strive on to finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle and for his widow and his orphan, to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations.

Write an essay in which you explain how President Lincoln, in his second inaugural address, builds an argument to encourage the country to end the Civil War and transition smoothly back into the Union. In your essay, analyze how Lincoln uses one or more of the features listed above (or features of your own choice) to strengthen the logic and persuasiveness of his argument. Be sure that your analysis focuses on the most relevant aspects of the passage.

Your essay should not explain whether you agree with Lincoln's claims, but rather explain how Lincoln builds his argument to persuade his audience.

END OF TEST

DO NOT RETURN TO A PREVIOUS SECTION.

