

明志教育

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明志教育
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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 Isabel Allende, *Maya's Notebook*. ©2013 by Isabel Allende. The narrator is a teenage girl who was raised by her grandparents, Nidia and Paul (whom she calls Nini and Popl).

Nidia Vidal stayed in Toronto for a couple of years, counting the days and the hours, until she met Paul Ditson II, my Popo, a professor at the University of California in Berkeley, who had gone to
5 Toronto to give a series of lectures about an elusive planet, whose existence he was trying to prove by way of poetic calculations and leaps of the imagination. My Popo was one of the few African Americans in the overwhelmingly white profession
10 of astronomy, an eminence in his field and the author of several books. As a young man he'd spent a year at Lake Turkana, in Kenya, studying the ancient megaliths of the region. He developed a theory, based on archeological discoveries, that those basalt
15 columns were astronomical observatories and had been used three hundred years before the Christian era to determine the Borana lunar calendar, which is still in use among shepherds in Ethiopia and Kenya. In Africa he learned to observe the sky without
20 prejudice and that's how he began to suspect the existence of the invisible planet, for which he later searched the sky in vain with the most powerful telescopes.

The University of Toronto put him up in a suite
25 for visiting academics and hired a car for him through an agency, which is how Nidia Vidal ended up escorting him during his stay. When he found out that his driver was Chilean, he told her he'd been at La Silla observatory, in Chile. He said that in the
30 southern hemisphere you can see constellations and galaxies unknown in the north, like the Small Magellanic Cloud and the Large Magellanic Cloud. and that in some parts of the country, the nights are so clear and the climate so very dry that conditions
35 for scrutinizing the firmament are ideal. That's how they discovered that galaxies cluster together in designs that resemble spiderwebs.

By one of those coincidences that normally happen only in novels, his visit to Chile ended on the
40 very same day in 1974 that she left with her son for Canada. I often wonder if maybe they were in the airport at the same time waiting for their respective flights, but not meeting. According to them this would have been impossible, because he would have
45 noticed such a beautiful woman and she would have seen him too--a Black man stood out in Chile back then, especially one as tall and handsome as my Popo.

A single morning driving her passenger around
50 Toronto was enough for Nidia to realize that he possessed that rare combination of a brilliant mind with the imagination of a dreamer, but entirely lacked any common sense, something she was proud

to have in abundance herself. My Nini could never
 55 explain to me how she'd reached that conclusion
 from behind the steering wheel of a car while
 navigating her way through the traffic, but the fact is,
 she was absolutely right. The astronomer was living a
 life as lost as the planet he was searching the sky for;
 60 he could calculate in less than the blink of an eye how
 long it would take a space ship to arrive at the moon
 if it was traveling at 28,286 kilometers per hour, but
 he remained perplexed by an electric coffeemaker.
 She had not felt the elusive flutter of love for years,
 65 and this man, very different from all those she'd met
 in her thirty-three years, intrigued and attracted her.
 My Popo, quite frightened by his driver's boldness
 in traffic, also felt curiosity about the woman hidden
 inside a uniform that was too big for her and wearing
 70 a bear hunter's cap. He was not a man to give in
 easily to sentimental impulses, and if the idea of
 seducing her briefly crossed his mind, he
 immediately dismissed it as awkward. My Nini on
 the other hand, who had nothing to lose, decided to
 75 collar the astronomer before he finished his lectures.
 She liked his mahogany color and sensed that the two
 of them had a lot in common: he had astronomy and
 she astrology, which she considered to be practically
 the same thing. She thought they'd both come from a
 80 long way away to meet at this spot on earth and in
 their destinies, it was written in the stars.

1

What is the main effect of the word “elusive” as used in lines 6 and 64?

- A) It implies that Paul and Nidia have had similar experiences in their professional lives.
- B) It emphasizes Paul and Nidia's belief that the most important goals in life are the most difficult to achieve.
- C) It suggests a possible parallel between Paul's long-standing goal and Nidia's experiences with romance.
- D) It reinforces the difficulties of reconciling Paul's professional responsibilities with Nidia's Personal desires.

2

The phrases “poetic calculations” and “leaps of the imagination.” as used in the first paragraph, suggest that Paul's goal regarding a planet is

- A) an ingenious undertaking that will transform the field of astronomy.
- B) a fanciful quest that may or may not be fulfilled.
- C) an imaginative solution to a problem that has long vexed astronomers.
- D) a romantic pursuit that reveals Paul's longing for the past.

3

The narrator implies that other astronomers viewed Paul as someone who

- A) sacrificed his personal life in order to further his own research.
- B) served as an important role model for his own students.
- C) was respected because of his considerable professional accomplishments.
- D) challenged the established theories of more successful scientists.

4

Based on the passage, which statement best expresses Paul's theory about the ancient megaliths of Kenya?

- A) They were used in various religious rituals that predated the Christian era.
- B) They allowed astronomers to observe subtle changes in constellations over the years.
- C) They helped Ethiopian and Kenyan shepherds to care for their flocks.
- D) They were useful in providing a system of delineating time.

5

According to the passage, Paul was enthusiastic about Chile because of its

- A) renowned observatories that provided evidence of an ancient religions tradition.
- B) powerful telescopes that were available to visiting astronomers.
- C) optimal circumstances for effective astronomical observation.
- D) enterprising scientists who had discovered many new galaxies.

6

The narrator views the circumstances under which her grandparents could have first met as.

- A) containing elements that are difficult to imagine occurring in real life.
- B) reinforcing the idea that romantic relationships develop over time.
- C) instructive for those who place too much value on appearances.
- D) obscured by repeated accounts over the years.

7

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

- A) Lines 24-27 (“The University...stay”)
- B) Lines 38-41 (“By one ...Canada”)
- C) Lines 43-48 (“According ...Popo”)
- D) Lines 49-54 (“A single ...herself”)

8

Which statement about Paul's particular living abilities can most reasonably be inferred from passage?

- A) Paul is creative but often illogical in living processes.
- B) Paul has little aptitude for confronting life challenges.
- C) Paul is adept at comprehending the for language of poetry.
- D) Paul has an intuitive understanding of people and astronomy.

9

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

- A) Lines 29-35 (“He said...ideal”)
- B) Lines 33-37 (“That's ...spiderwebs”)
- C) Lines 58-63 (“The astronomer...coffeemaker”)
- D) Lines 67-70 (“My Popo...cap”)

10

The narrator implies that compared with Paul, Nidia is

- A) wiser and more philosophical.
- B) more intelligent and innovative.
- C) quieter and more reflective.
- D) more assured and decisive.

Questions 12-20 are based on the following passage.

This passage is adapted from John Ruskin. *The Stone of Venice*. Originally published in 1853. Ruskin grew up during the Industrial Revolution, when, for the first time, large numbers of English laborers began to work in factories.

- You must either make a tool of the creature, or a man of him. You cannot make both. Men were not intended to work with the accuracy of tools, to be precise and perfect in all their actions. If you will
- 5 have that precision out of them, and make their fingers measure degrees like cog-wheels, and their arms strike curves like compasses, you must unhumanize them. All the energy of their spirits must be given to make cogs and compasses of
- 10 themselves.
- We have much studied and much perfected, of late, the great civilized invention of the division of labour; only we give it a false name. It is not, truly speaking, the labour that is divided; but the men:
- 15 --Divided into mere segments of men--broken into small fragments and crumbs of life; so that all the little piece of intelligence that is left in a man is not enough to make a pin, or a nail, but exhausts itself in making the point of a pin or the head of a nail.
- 20 Now it is a good and desirable thing, truly, to make many pins in a day; but if we could only see with what crystal sand their points were polished,--sand of human soul, much to be magnified before it can be discerned for what it is--we should think there
- 25 might be some loss in it also. And the great cry that rises from all our manufacturing cities, louder than their furnace blast, is all in very deed for this,--that we manufacture everything there except men; we blanch cotton, and strengthen steel, and refine sugar,
- 30 and shape pottery; but to brighten, to strengthen, to refine, or to form a single living spirit, never enters into our estimate of advantages. And all the evil to which that cry is urging our myriads can be met only in one way: not by teaching nor preaching, for to
- 35 teach them is but to show them their misery, and to preach to them, if we do nothing more than preach, is to mock at it. It can be met only by a right understanding, on the part of all classes, of what kinds of labour are good for men, raising them, and
- 40 making them happy; by a determined sacrifice of

such convenience, or beauty, or cheapness as is to be got only by the degradation of the workman; and by equally determined demand for the products and results of healthy and ennobling labour.

- 45 And how, it will be asked, are these products to be recognized, and this demand to be regulated? Easily: by the observance of three broad and simple rules:

1. Never encourage the manufacture of any article not absolutely necessary, in the production of which

50 *Invention* has no share.

2. Never demand an exact finish for its own sake, but only for some practical or noble end.

3. Never encourage imitation or copying of any kind, except for the sake of preserving records of great

55 works.

For instance. Glass beads are utterly unnecessary, and there is no design or thought employed in their manufacture. They are formed by first drawing out the glass into rods; these rods are chopped up into

60 fragments of the size of beads by the human hand, and the fragments are then rounded in the furnace. The men who chop up the rods sit at their work all day, their hands vibrating with a perpetual and exquisitely timed palsy, and the beads dropping

65 beneath their vibration like hail. Neither they, nor the men who draw out the rods or fuse the fragments, have the smallest occasion for the use of any single human faculty; and every young lady, therefore, who buys glass beads is engaged in the

70 slave-trade, and in a much more cruel one than that which we have so long been endeavouring to put down.

But glass cups and vessels may become the subject of exquisite invention; and if in buying these we pay

75 for the invention, that is to say, for the beautiful form, or colour, or engraving, and not for mere finish of execution, we are doing good to humanity.

11

In the passage, Ruskin claims that industrial labor

- A) is physically challenging.
- B) relies on dangerous processes.
- C) dehumanizes workers.
- D) serves no useful purpose.

12

The main purpose of the comparisons in lines 5-7 (“their fingers...compasses”) is to

- A) emphasize the artistry of particular mechanical processes.
- B) show how certain tasks turn human beings into machines.
- C) point out the similarities between human work and mechanical work.
- D) underscore the need for precision in toolmaking.

13

Ruskin suggests that factory work is too

- A) focused on limited and tedious tasks.
- B) dependent on derivative and clumsy techniques.
- C) influenced by monetary gain.
- D) undervalued by ordinary individuals.

14

It can most reasonably be inferred from the passage that Ruskin would concede which of the following claims about mass production?

- A) It is an efficient means of producing useful objects.
- B) It increases demand for particular products.
- C) It is preferable to other forms of production.
- D) It encourages honest, hard labor.

15

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

- A) Lines 2-4 (“Men...actions”)
- B) Lines 20-21 (“Now...day”)
- C) Lines 30-32 (“but to...advantages”)
- D) Lines 37-40 (“It...happy”)

16

In his discussion of “our manufacturing cities” (line 26), Ruskin argues that

- A) workers would be healthier if manufacturing took place outside of cities.
- B) laborers should demand improvements in working conditions.
- C) more attention should be given to the manufacture of household items.
- D) society should not value products over people.

17

As used in line 47, “broad” most nearly means

- A) large.
- B) open.
- C) general.
- D) tolerant.

18

As used in line 52, “end” most nearly means

- A) boundary.
- B) goal.
- C) termination
- D) limit.

19

Ruskin suggests that consumers should make every effort to purchase beautiful things that are

- A) produced by creative labor.
- B) created in great quantities.
- C) convenient and easy to use.
- D) made by self-employed artisans.

20

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

- A) Lines 8-10 (“All...themselves”)
- B) Lines 56-58 (“Glass...manufacture”)
- C) Lines 59-61 (“these...furnace”)
- D) Lines 74-77 (“and...humanity”)

Questions 21-30 are based on the following passage and supplementary material.

This passage is adapted from Ed Yong, "Moths Remember What They Learn as Caterpillars." © 2008 by ScienceBlogs LLC.

The transformation from caterpillar to butterfly or moth is one of the most beguiling in the animal world. Both larva and adult are just stages in the life of a single animal, but are nonetheless completely separated in appearance, habitat and behaviour. The imagery associated with such change is inescapably beautiful, and as entrancing to a poet as it is to a biologist.

According to popular belief, within the pupa, the caterpillar's body is completely overhauled, broken down into a form of soup and rebuilt into a winged adult. Richard Buckminster Fuller once said that "there is nothing in a caterpillar that tells you it's going to be a butterfly." Indeed, as the butterfly or moth quite literally flies off into a new world, it is tempting to think there is no connection between its new life and its old existence as an eating machine.

But not so. A new study has provided strong evidence that the larval and adult stages are not as disparate as they might seem. Adult tobacco hookworms – a species of moth – can remember things that it learned as a caterpillar, which means that despite the dramatic nature of metamorphosis, some elements of the young insect's nervous system remain intact through the process.

Using some mild electric shocks, Blackiston from Georgetown University trained hookworm caterpillars (*Manduca sexta*) to avoid the scent of a simple organic chemical – ethyl acetate. The larvae were then placed in the bottom end of a Y-shaped tube, with the scent of ethyl acetate wafting down one arm and fresh air coming down the other. Sure enough, 78% of the trained caterpillars inched down the odour-free arm.

As the caterpillar moulted their way through the larval stage, their aversion to ethyl acetate remained. Blackiston allowed them to pupate and emerge as full-grown moths, before testing them again, about a month after their initial 'electric' education. Bear in mind that a tobacco hornworm lives for about 30 to 50 days, so a month is very close to its entire life span.

Amazingly, 77% of the adult moths also avoided the ethyl acetate-scented arm of the Y-shaped tube and the vast majority of these were the adult versions of the same larvae that had correctly learned the behaviour originally. Clearly, the larvae had learned to avoid the chemical and that memory carried over into adulthood.

Even so, Blackiston was careful to rule out alternative explanations. For a start, ethyl acetate isn't naturally foul-smelling. It's actually rather reminiscent of pear drops and when larvae are exposed to it in the absence of electric shocks, neither they nor the adults they become learn to avoid it.

Another possible explanation hinges on the fact that adults emerging from the pupa usually experience a similar milieu of smells to their caterpillar selves. This chemical legacy could explain why adults and larvae react similarly to some odours. But when Blackiston applied ethyl acetate gel to the pupae of untrained caterpillars, the adults did not shrink away from the chemical. Nor did washing the pupae of trained caterpillars, to get rid of any lingering traces of ethyl acetate, have any effect.

Blackiston was convinced that some aspect of the caterpillar's nervous system was carried over into adulthood. However, he also found that this only happened if caterpillars are trained at the last possible stage before they pupate – the 'fifth instar'. Any earlier, and the memories don't stick.

The fruitfly *Drosophila* suggests why this might happen. In its brain, memories of smells are located in mushroom bodies, brain structures that consist of three lobes. The gamma lobe develops very early while the alpha and beta lobes develop just before the pupal stage.

Blackiston thinks that long-lasting larval memories are written into the alpha and beta lobes, whose neural networks are kept around while the rest of the caterpillar breaks down. If the larvae are too young, these areas haven't developed yet and any learned information is stored in the gamma lobe and lost when its connections are trimmed back in the pupa.

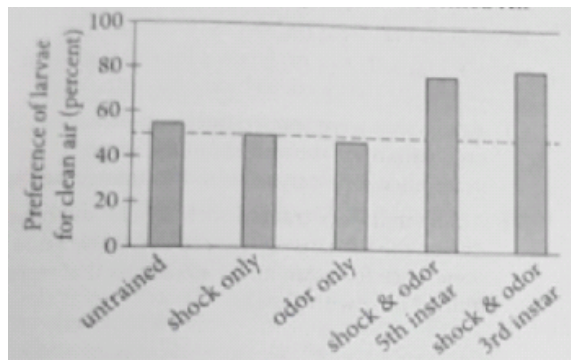
But why bother? After all, the entire advantage of metamorphosis rests on the very different lifestyles and habitats of caterpillars and moths, which

allow them to avoid competing with each other.

- 90 Nonetheless, moths and butterflies must still return to the right sort of plant in order to lay their eggs and Blackiston suggests that their larva-hood memories may help them to do so.

Figure 1

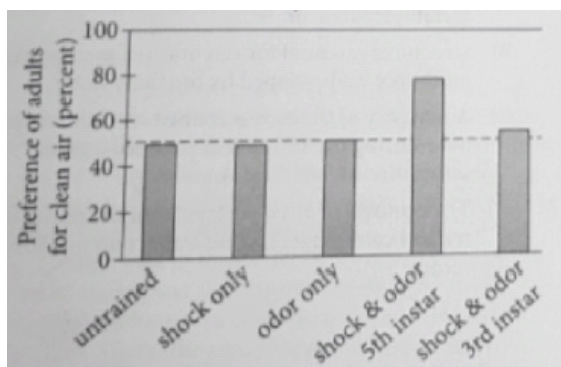
Hornworm Larvae Choosing Clean Air over Ethyl Acetate-Scented Air



Treatment

Figure 2

Hornworm Moths Choosing Clean Air over Ethyl Acetate-Scented Air



Treatment

Figures adapted from J.Blackiston,Elena Silva Casey,and Martha R Weiss,"Retention of Memory through Metamorphosis;Can a Moth Remember What it Learned as a Caterpillar?"o2008 by Douglas J, Blackiston,Elena Silva Casey,and Martha R,Weiss.

21

The Passage makes the most extensive use of which type of evidence?

- A) Statistical projections
- B) Anecdotal observations
- C) Findings from previous studies
- D) Experimental results

22

As used in line 11, "form" most nearly means

- A) style.
- B) component
- C) kind
- D) method

23

It can reasonably be inferred from the passage that the hornworm caterpillars in Blackiston's experiments

- A) were well suited for training because of their short life span.
- B) acquired a behavior in response to an adverse association.
- C) could be monitored more easily than other species of caterpillars.
- D) were more sensitive to smells than other caterpillars would have been.

24

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

- A) Lines 26-29("Using...acetate")
- B) Lines 35-36("As the...remained")
- C) Lines 39-42("Bear...span")
- D) Lines 47-49("Clearly...adulthood")

25

Based on the passage, what can most reasonably be inferred about hornworm caterpillars and their reaction to ethyl acetate?

- A) Their strong dislike of ethyl acetate is a recent adaptation.
- B) Their ability to detect ethyl acetate occurs only when they are trained during the fifth instar.
- C) Their avoidance of ethyl acetate is observed most frequently among those that are about to pupate.
- D) Their negative response to ethyl acetate is not something that would be displayed in the wild.

26

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

- A) Lines 51-55 (“For a..avoid it”)
- B) Lines 63-65 (“Nor did...effect”)
- C) Lines 66-68 (“Blackiston...adulthood”)
- D) Lines 78-81 (“Blackiston..down”)

27

As used in line 66, “aspect” most nearly means

- A) appearance.
- B) nature.
- C) part.
- D) status.

28

The last paragraph of the passage serves mainly to

- A) introduce a new line of discussion.
- B) summarize the findings of a major study.
- C) question the usefulness of an experiment.
- D) indicate why a particular capability might be useful.

29

According to figure 2, which statement about the adult tobacco hornworms in Blackiston's theory is true?

- A) Adults that were trained with shocks during the third instar showed a great preference for clean air than did adult trained during the fifth instar.
- B) Adults that were trained only with the shocks showed greater preference for clean air than did adults that were trained only with odor.
- C) Adults that were trained only with shocks and ones only with odor showed about the same preference for clean air as did untrained ones.
- D) Adults that were trained with shocks and odors during the fifth instar showed about same preference for clean air as did adults trained only with shocks.

30

Which claim from the passage is most directly supported by the data presented in the figure 1 and 2 ?

- A) Most of the adult moths that chose clean air are those that had as larvae learned to avoid acetate-scented air.
- B) Structures essential for retention of metamorphosis in moths are undeveloped by the third instar.
- C) A majority of the moths trained with shock and odor during the fifth instar retained same associations from their larval stage.
- D) The removal of ethyl acetate from then trained caterpillars had no impact on brain recall.
- E) If you need answers of this test, please contact

Questions 31-41 are based on the following passage and supplementary material.

"Look, Something Shiny! How Color Images Can Influence Consumers." © 2015 by The Ohio State University.

When it comes to buying things, our brains can't see the big, black-and-white forest for all the tiny, colorful trees.

That's the conclusion of a new study, which found that people who were shown product images in color were more likely to focus on small product details -- even superfluous ones -- instead of practical concerns such as cost and functionality.

The findings mesh well with notions of how vision evolved in the brain, and suggest that viewing objects in black and white helps our brains focus on what's most important.

"Color images help us notice details," said Xiaoyan Deng, an author of the study and assistant professor of marketing at Ohio State. "But black-and-white images let us see the 'big picture' without getting bogged down by those details."

The findings also suggest how marketers can strategically use color -- or its absence -- to change how we feel about a product.

"Marketers may take it for granted that color is always the best presentation format for advertising," Deng added. "This study shows that while color is desirable in most situations, it's not desirable in all situations."

If a product has broad features that set it apart from the competition, then black-and-white images will help customers cast aside minor details and focus on those key features, the researchers found. If a product's details are what set it apart, color images will make those details stand out.

In one part of the study, 94 college students were asked to imagine that they were traveling to a remote campsite where they could receive only one radio station. There, the campsite manager offered two radios for rent: a basic analog radio for \$10 a day, or a fancy digital radio with many station preset buttons for \$18 a day. Not only was the digital radio more expensive, but its preset buttons would be useless at the campsite.

Students who saw pictures of the radios in black

and white tended to make the practical choice -- the analog radio. Only 25 percent chose the digital radio.

But among students who saw the radios in color, twice as many chose the digital radio. In that scenario, 50 percent of students were willing to pay a higher price for a radio with features that they could not use.

"Color drew their focus away from the most important features to the less important features, and their choice shifted to the more expensive radio," Deng said. "I think that's surprising -- that just by manipulating whether the product presentation is in color or black and white, we can affect people's choice."

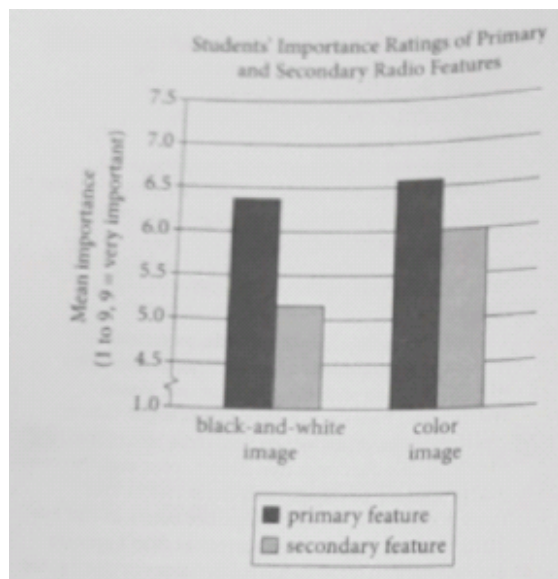
Study co-author Kentaro Fujita, associate professor of psychology at Ohio State, has an idea why. It has to do with the origin of our visual systems, and how our brains process night vision.

Of the light-sensitive rod and cone structures in the retina, it's the cones that detect color and the rods that give us night vision, peripheral vision and motion detection. Rods outnumber cones in the eye 20 to 1, and at night, when the cones don't receive enough light to let us distinguish colors properly, we rely on the rods to see what's happening around us -- in black and white.

"Our visual systems evolved to work in both optimal and suboptimal conditions," Fujita explained. "Optimal conditions might be during the day, when I want to distinguish a red apple from a not-so-red apple. The form of the object tells me it's an apple, but I can focus on the color because that's what's important to me. Suboptimal conditions might be at night, when I have to tell whether that object that's moving toward me is my friend or a hungry lion. Then the form of the object is critical."

He suspects that when our eyes see black-and-white images, our brains interpret them in ways similar to night vision: We focus on form and function, and tend to ignore details.

Students' Importance Ratings of Primary and Secondary Radio Features



Adapted from Hyojin Lee et al. "Monochrome Forests and Colorful Trees: The Effect of Black-and-White versus Color Imagery on Construal Level." © 2014 by Journal of Consumer Research, Inc.

31

Which choice best states the central idea of the passage?

- A) People tend to view products presented in color as being of better quality than similar products that are presented in black and white.
- B) The minor details of products stand out more if those products are presented in black and white than if they are presented in color.
- C) When purchasing decisions are made based on color images of products, those decisions are generally more impulsive than are decisions based on black-and-white images.
- D) Seeing products presented in color can lead people to focus on different product characteristics than people do when seeing those products in black and white.

32

The author of the passage makes which assumption about the behavior of the subjects in Deng and Fujita's experiment?

- A) It derives from people's innate preference for color images over black-and-white images.
- B) It is at odds with consumers' tendency to make choices based on cost and functionality rather than visual appeal.
- C) It demonstrates the existence of a trait in consumers that marketers have unknowingly exploited in the past.
- D) It is a good indicator of how people would respond to color and black-and-white advertisements in real-world settings.

33

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

- A) Lines 1-3 ("When..trees")
- B) Lines 9-12 ("The findings...important")
- C) Lines 18-20 ("The findings...product")
- D) Lines 58-59 ("It has...vision")

34

It can reasonably be inferred from the passage that the strategic use of black-and-white representation of products is

- A) a subject of long-running debate among marketers.
- B) an innovation that has had considerable commercial success.
- C) an effective way to promote products that are largely similar to their competition.
- D) a technique not typically employed to sell products.

35

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

- A) Lines 13-15("Color..trees")
- B) Lines 15-17("But black and white...details")
- C) Lines 21-23("Marketers...added")
- D) Lines 26-31("If a...out")

36

The main function of the eighth through tenth paragraphs (lines 32-48) is to

- A) synthesize the findings of two independent studies.
- B) describe the design and results of an experiment.
- C) discuss a common scenario and its typical outcomes.
- D) draw a contrast between two models of behavior.

37

As used in line 53, "manipulating" most nearly means.

- A) falsifying.
- B) controlling.
- C) operating.
- D) tampering.

38

As used in line 65, "distinguish" most nearly means

- A) perceive.
- B) classify.
- C) divide.
- D) demonstrate.

39

The references to apples, a friend, and a lion in the fourteenth paragraph (lines 68-77) primarily serve to

- A) illustrate a distinction between situations that may help account for the findings discussed in the passage.
- B) explain an experiment that helps to corroborate the conclusions presented in the passage.
- C) acknowledge an unexplained aspect of the phenomenon described in the passage.
- D) offer examples that cast doubt on the central claim put forward in the passage.

40

According to the graph, when students saw a radio's image in color, their mean rating of its secondary feature was.

- A) 5.0.
- B) 5.5.
- C) 6.0.
- D) 6.5.

41

Which statement about students' ratings of the importance of the radio's features is best supported by data in the graph?

- A) Students rated the radio's secondary feature as more important than its primary feature only when they saw the radio in color.
- B) Students rated the radio's primary feature as more important than its secondary feature regardless of whether they saw the radio in black and white or in color.
- C) Students rated the radio's primary feature as more important when they saw the radio in black and white than when they saw it in color.
- D) Students rated more features of the radio as very important when they saw it in black and white than when they saw it in color.

Questions 42-52 are based on the following passages.

Passage 1 is adapted from the website of the Society of Plant Signaling and Behavior. © 2015 by the Society of Plant Signaling and Behavior. Passage 2 is adapted from Michael Pollan. "The Intelligent Plant." © by Conde Nast. Both passages discuss plant neurobiology, the study of the sensory adaptive behavior of plants.

Passage 1

For a better understanding of the world around us, it is important that we develop and share the growing understanding of plants as dynamic and highly sensitive organisms. No longer can plants be
 5 viewed and portrayed as passive entities merely subject to environmental forces, as 'automata'-like organisms based only on reflexes and optimised solely for accumulation of photosynthate. With a fuller understanding of signaling and
 10 communication within and among plants, it becomes clear that these sensitive biological organisms actively and competitively forage for limited resources, both above and below ground. In addition, plants accurately compute their circumstances, use
 15 sophisticated cost benefit analysis, and they take tightly controlled actions to mitigate and control diverse environmental stressors. Plants also emerge as capable of discriminating positive and negative experiences, and 'learning' from their past
 20 experiences. Plants use this cognitively acquired information to update their behavior in order to survive present and future challenges of their environment. Moreover, plants are also capable of refined recognition of self and non-self, and are
 25 territorial in behavior.

This Plant Neurobiological view sees plants as information-processing organisms with complex communications of various types occurring throughout the individual plant. What we need to
 30 find out is how their information is gathered and processed, what routes do data take, and how are adaptive responses integrated and coordinated, how are these events 'remembered' in order to allow realistic predictions of future using past
 35 experiences.

Last but not least, plants are as sophisticated in

behavior as animals but this potential has been masked effectively because it operates on time scales many orders of magnitude slower than in animals.

40 At the very least, this quality should make it easier for experimental plant scientists to uncover the mysteries of their neurobiological function and behavioral responses.

Passage 2

Many plant scientists have pushed back hard
 45 against the nascent field of plant neurobiology, beginning with a tart, dismissive letter signed by thirty-six prominent plant scientists and published *Trends in Plant Science*. "We begin by stating simply that there is no evidence for structures such as
 50 neurons, synapses or a brain in plants," the authors wrote. No such claim had actually been made—the plant neurobiology advocates had spoken only of "homologous" structures¹—but the use of the word "neurobiology" in the absence of actual neurons was
 55 apparently more than many scientists could bear.

"Yes, plants have both short- and long-term electrical signalling, and they use some neurotransmitter-like chemicals as chemical signals," says Lincoln Taiz, an emeritus professor of plant
 60 physiology at U.C. Santa Cruz and one of the signers of the letter. "But the mechanisms are quite different from those of true nervous systems." Taiz says that the writings of the plant neurobiologists suffer from "over-interpretation of data, teleology,
 65 anthropomorphizing, philosophizing, and wild speculations." He is confident that eventually the plant behaviors we can't yet account for will be explained by the action of chemical or electrical pathways, without recourse to "animism." Clifford
 70 Slayman, a professor of cellular and molecular physiology at Yale, who also signed the letter, was even more blunt. " 'Plant intelligence' is a foolish distraction, not a new paradigm," he wrote in a recent e-mail. Slayman has referred to the letter as
 75 "the last serious confrontation between the scientific community and the nuthouse on these issues." Scientists seldom use such language when talking about their colleagues to a journalist, but this issue generates strong feelings, perhaps because it smudges
 80 the sharp line separating the animal kingdom from the plant kingdom. The controversy is less about the

remarkable discoveries of recent plant science than about how to interpret and name them: whether behaviors observed in plants which look very much
85 like learning, memory, decision-making, and intelligence deserve to be called by those terms or whether those words should be reserved exclusively for creatures with brains.

¹ Structures that are similar across species and provide evidence of common ancestry.

42

The main purpose of Passage 1 is to

- A) compare the actions of plants to the actions of animals.
- B) speculate on the means by which plants learn to communicate with one another.
- C) show that plants can be trained to alter their behavior in certain circumstances.
- D) argue that plants have greater abilities than they are given credit for.

43

The author of Passage 1 indicates that the Plant Neurological view considers plants to be organisms that can

- A) react to stimuli as rapidly as animals can.
- B) collect and make effective use of data.
- C) exhibit territorial behaviors only in certain climates.
- D) generate new neurons to extend their survival.

44

As used in line 24, “refined” most nearly means

- A) restrained.
- B) precise.
- C) exquisite.
- D) progressive.

45

According to the author of Passage 1, certain plant behaviors are difficult to observe because they

- A) take place over an extended period of time.
- B) vary depending on the species of plant being studied.
- C) cause no outward physical changes.
- D) are challenging to recreate in experimental environments.

46

The author of Passage 2 most directly suggests that the criticism in the letter to Trends in Plant Science is

- A) somewhat misleading because it misrepresents a belief held by plant neurobiologists.
- B) indicative of bias against ideas that in any way resemble those underlying plant neurobiology.
- C) potentially self defeating in that its harsh tone undermines legitimate objections to plant neurobiology.
- D) needlessly hostile toward specific researchers in its rejection of plant neurobiology as a field.

47

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

- A) Lines 44-48 (“Many...Science”)
- B) Lines 51-55 (“No such...bear”)
- C) Lines 72-74 (“Plant...e-mail”)
- D) Lines 81-88 (“The controversy...brains”)

48

As used in line 66, “wild” most nearly means

- A) random.
- B) unregulated.
- C) agitated.
- D) unfounded.

49

How would the scientists quoted in Passage 2 most likely respond to the overall argument put forth in Passage 1 ?

- A) They would assert that argument is put forth by people who lack experience as researchers.
- B) They would suggest that argument is based on deliberately false claims.
- C) They would consider that argument to be ultimately unscientific.
- D) They would admit that the argument explains certain ongoing puzzles.

50

Both passages make the point that plants are capable of

- A) engaging in some forms of communication and signaling.
- B) consciously interacting with surrounding stimuli.
- C) distinguishing between beneficial and harmful events.
- D) flourishing in more environments than was previously thought.

51

52

STOP

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

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 1-10 are based on the following passage.

Using Social Networks to Find New Recruits

Many businesses are using social networking sites (SNS) such as Facebook, Twitter, and **1** Linkedin, to recruit new employees. SNS provide access to a broad pool of potential applicants and allow employers to target the most promising candidates at a very low cost. Because of these **2** advantages, therefore recruitment on SNS is

1

- A) NO CHANGE
- B) Linkedin;
- C) Linkedin—
- D) Linkedin

2

- A) NO CHANGE
- B) advantages,
- C) advantages, and
- D) advantages;

nearly ubiquitous-according to a 2012 survey. 92 percent of employers use **3** now or plan to use in the future social media for this purpose. **4** Though not everyone uses SNS, employers need to carefully consider how to innovatively use SNS to attract viable job candidates.

For example, companies can raise their visibility by sharing compelling information on SNS. **5** Veronica Fielding is the president of Jump Start Social Media, she recommends that businesses maintain social networking

3

- A) NO CHANGE
- B) or plan to use
- C) or plan to use later in the future
- D) in the present or plan to use in the future

4

Which choice provides the best transition from the previous sentence.

- A) NO CHANGE
- B) That being the purpose.
- C) Since this strategy is so popular.
- D) Given the expense of hiring and training new workers.

5

Which choice most effectively combines the sentences at the underlined portion?

- A) Veronica Fielding is the president of Jump Start Social Media who recommends
- B) That recommendation of Veronica Fielding, the president of Jump Start Social Media, is
- C) Veronica Fielding, whose presidency is of Jump Start Social Media, recommends
- D) Veronica Fielding, president of Jump Start Social Media, recommends

accounts that share engaging articles, feature industry insights, **6** and the posting of job opportunities.

When a company becomes popular on SNS because of clever or informative content the company's job postings are also **7** seen from a wider audience of candidates. **8** The UK department store Harrods, for instance, has attracted a dedicated audience online by employing Fielding's method.

6

- A) NO CHANGE
- B) also posting job opportunities.
- C) and post job opportunities.
- D) and post job opportunities for jobs.

7

- A) NO CHANGE
- B) scene by
- C) seen among
- D) seen by

8

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

Employers in a variety of countries have form success recruiting on SNS.

Should the writer make this addition here?

- A) Yes, because it supports the passage's claim about innovation in the use of SNS.
- B) Yes, because it ties the discussion of content in this paragraph to the discussion of direct recruitment in the next paragraph.
- C) No, because it restates information about international recruitment discussed earlier of passage.
- D) No, because it diverges from the paragraph's discussion of producing engaging content.

[1] Recruiters such as Amanda Ericson, director of talent acquisition at the Spitfire Group, often **9** use SNS to cultivate relationships with potential hires. [2] Ericson offers career advice and resources to people in the software industry and notifies them when a position becomes available. [3] Because her company has a small staff and rigorous requirements—all candidates must have a minimum of the years of work experience in their areas of expertise—she sometimes develops these relationships for many months before making a job offer. [4] This strategy proved effective for the Spitfire Group, as its use of social networking tools allowed it to double the size of its workforce in 2013. **10**

9

- A) NO CHANGE
- B) uses
- C) is using
- D) has used

10

To improve the cohesion and flow of this paragraph, the writer wants to add the following sentence.

Companies can also use SNS to target-prospective applicants.

The sentence should be placed

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

While Fielding's and Ericson's methods may improve companies' visibility, these elaborate social networking strategies can prove time consuming. Still, SNS position companies to engage with a more interconnected world. As Chirag Kang, the CEO of Reppify, a company that specializes in using social media data for recruitment purposes, explains, **11** "Remember, half the talent out there is always looking for the next big opportunity and birds of the same feather flock together." Ultimately, a company's success is dependent on talented employees, and many firms today are turning to SNS to bolster their applicant pool.

11

At this point, the writer wants to include a quotation that illustrates the point made in the previous sentence. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) "It is a challenge to derive useful information, such as passion around a particular technology or relevant professional connections."
- C) "Social media can become a fascinating place for employers to find talent that they may not be able to find otherwise."
- D) "We do think the use of social media by employers will continue to be the trend."

Questions 12-22 are based on the following passage.

The Father of Black History Month

In a 1926 article, Carter G. Woodson -- a prominent scholar who, in 1915, founded the organization known today as the Association for the Study of African American Life And History **12** (ASALH), lamented the absence of African American history from most school textbooks of the time. The neglect was symptomatic of long standing prejudices, he noted, and served merely to perpetuate them. Woodson believed that the inclusion of African American history in school curricula could help to overturn such **13** prejudices. Leading to “an appreciation of the virtues of all races, creeds, and colors.” **14** To this end, Woodson conceived Negro History Week, an educational initiative celebrating the history and contributions of African Americans.

12

- A) NO CHANGE
- B) (ASALH)--
- C) (ASALH)
- D) (ASALH);

13

- A) NO CHANGE
- B) prejudices; leading
- C) prejudices, leading
- D) prejudices leading

14

- A) NO CHANGE
- B) For example,
- C) After all
- D) In other words,

Woodson planned the first Negro History Week for the second week of February in 1926. He faced some opposition at **15** first, he was denied funding for his project from organizations like the Carnegie Institution. However, he eventually **16** hit the jackpot with a partnership with the Library of Congress. To publicize his idea, Woodson sent out pamphlets announcing and explaining the occasion to state officials, boards of education, **17** newspapers, and community centers. He encouraged educators and community leaders to organize lectures, put on plays, **18** and having students recite speeches and poems. Following the first Negro History Week, Woodson reported that several state departments of education had actively promoted the event and that donations to the ASALH had increased. Much work, however, remained to be done.

15

- A) NO CHANGE
- B) first;
- C) first; and
- D) first

16

Which choice best maintains the tone of the passage?

- A) NO CHANGE
- B) scored in
- C) found success in
- D) lucked out with

17

- A) NO CHANGE
- B) newspapers; and
- C) newspapers-and
- D) newspapers and,

18

- A) NO CHANGE
- B) and students having to
- C) having students
- D) and have students

19 Seeking to redress a persistent problem in the educational system, Woodson was able to augment the initiative. Over the next few years, the ASALH produced and distributed to schools a wider variety of educational 20 materials. Negro History Week was not immediately adopted by everyone, but it did catch on state by state, and the events surrounding it became more elaborate.

19

Which choice provides the best transition from the discussion in the previous paragraph?

- A) NO CHANGE
- B) With the publicity and funds generated by the first Negro History Week.
- C) Aided by other members of the ASALH,
- D) Delivering speeches throughout the country that focused on race and education,

20

The writer is considering revising the underlined portion to the following.

materials, including a set of 160 photographs depicting prominent African Americans and a “Table of 152 Important Events And Dates in Negro History.”

Should the writer make this revision?

- A) Yes, because it provides specific examples of the materials that were distributed to schools by the ASALH.
- B) Yes, because it shows how long standing prejudices had persisted before the first Negro History Week
- C) No, because it merely repeats information about Negro History Week stated previously in the passage.
- D) No, because it distracts from the passages focus with irrelevant details about the ASALH’s involvement.

In 1930, for example. Woodson organized a 2,000 person fund raising **21** banquet. The banquet took place in Washington, DC, It featured speeches by three African American members of Congress. Woodson used a portion of the proceeds from such fund raisers to develop Negro History Weed Kits-containing a selection of famous speeches and photographs, as well as a play about black history-specifically for areas with few resources.

22 Woodson's timely intervention was a catalyst for lasting change as he brought American history to schools and communities across the nation. Negro History Week continued growing after Woodson's death recognized as Black History Month.

21

Which choice most effectively combines the sentences at the underlined portion?

- A) banquet, taking place and featuring speeches in Washington, DC,
- B) banquet in Washington, DC, that featured speeches
- C) banquet, which featured speeches that took place in Washington, DC,
- D) banquet that featured speeches and also took place in Washington, DC,

22

The writer wants to state the main idea of the passage. Which choice most effectively accomplishes this goal?

- A) NO CHANGE
- B) The ASALH spearheaded a variety of outreach efforts that aimed to enhance cultural awareness throughout the country.
- C) Woodson's strategic partnerships with nonprofit organizations were ultimately critical to the success of Negro History Week.
- D) Woodson's example proved highly influential for later scholars of African American history such as Lorenzo Greene.

Questions 23-33 are based on the following passage and supplementary material.

A Glint in the Fly's Eye

In the early morning of October 15, 1991, a remarkable phenomenon occurred in the skies over Dugway Proving **23** Ground, being a US Army facility in Utah. At 1:34 a.m. a single proton cosmic ray collided with the nucleus of an atom in the upper atmosphere, creating a shower of subatomic particles and ultraviolet light. While not visible to the naked eye, the collision was spotted by **24** Dugways' cosmic rays detector, the "Fly's Eye." Using data collected from the ultraviolet light detected by the Fly's Eye, **25** the energy of the cosmic ray. physicists estimate, was an extraordinary 510 million ergs-equivalent to the kinetic energy of a baseball traveling at 55 miles per hour. Unfortunately, identifying the "pitcher" of this cosmic baseball and others like it is especially challenging; ultrahigh-energy cosmic rays (UHECRs) are not not only extremely rare but also of mysterious origin.

23

- A) NO CHANGE
- B) Ground, which is
- C) Ground, that is
- D) Ground,

24

- A) NO CHANGE
- B) Dugway's cosmic ray's
- C) Dugway's cosmic rays'
- D) Dugway's cosmic ray

25

- A) NO CHANGE
- B) the cosmic ray's energy as estimated by physicists
- C) physicists estimated that the cosmic ray's energy
- D) physicists' estimate of the cosmic ray's energy

Ordinary cosmic rays, whose energies are typically measured in the hundreds or thousands of ergs rather than the millions, are thought to be produced by shock waves created when massive stars in our galaxy, the Milky Way, explode as supernovae. **26** Nevertheless, UHECRs with energies of 90 million ergs or greater, such as the cosmic ray detected by the Fly's Eye, are thought to originate **27** somewhere else. They are thought to originate in a place outside our galaxy-but where?

26

- A) NO CHANGE
- B) on the other hand,
- C) In fact,
- D) As a result,

27

Which choice most effectively combines the sentences at the underlined portion?

- A) in a place somewhere else-
- B) somewhere else, in some place
- C) in a place that is somewhere
- D) somewhere

28 After puzzling over the question for years, physicists eventually found a solution by partnering with an unlikely 29 accomplice: the neutrino. Neutrinos are any uncharged particles created in nuclear reactions and energetic collisions such as those that produce cosmic rays. Because neutrinos are not affected by electric and magnetic fields, 30 their trajectory is not bent. Physicists theorized that if UHECR detections such as the one at Dugway could be correlated to observed neutrino events, the neutrinos' trajectories could then be used to pinpoint the origin of both the neutrinos and the cosmic rays. A search of known galaxies might then yield potential sources of the particles.

28

Which choice provides the most effective transition from the previous paragraph to this one?

- A) NO CHANGE
- B) Despite their confidence that they would soon find an answer,
- C) Given their excitement about UHECRs,
- D) To confirm their initial hypothesis,

29

- A) NO CHANGE
- B) ally:
- C) accessory:
- D) conspirator:

30

- A) NO CHANGE
- B) its trajectories are
- C) its trajectory is
- D) their trajectories are

Recent data from the Ice Cube Neutrino Observatory in Antarctica show **31** why physicists are skeptical. Physicists have detected numerous UHECRs that are directionally correlated with neutrino events, and they are using the information to identify the cosmic rays' galactic sources. To take one example, physicists analyzed a cosmic ray that measured **32** 240 million ergs and was captured by a detector in Japan. By correlating **33** them with a particular neutrino event (#17 in the table), physicists have determined that the UHECR likely originated in a galaxy known as RX J1631.3+2352. Once physicists establish where a UHECR was created, they can begin to answer an even more tantalizing question: *how*?

IceCube Neutrino Events Correlated with UHECRs

Neutrino event	Cosmic ray energy (millions of ergs)	Location of cosmic ray detector	Potential source
2	240	Japan	SS 442
11	160	Argentina	RBS 833
17	231	Japan	RX J1631.3+2352
21	179	Argentina	PKS 2331-240
34	186	England	NGC 7679

Sources Data from R. Moharana and S. Razzaque, "Angular Correlation of Cosmic Neutrinos with Ultrahigh-Energy Cosmic Rays and implications for Their Sources." Submitted to the *Journal of Cosmology and Astroparticle Physics* in 2015; and from the SIMBAD astronomical database. © 2015 by Strasbourg Astronomical Data Center.

31

Which choice most effectively sets up the information that follows in the paragraph and the table?

- A) NO CHANGE
- B) the effectiveness of this approach
- C) how one problem leads to another.
- D) that this research is happening all over the world.

32

Which choice accurately reflects the information in the paragraph and the table?

- A) NO CHANGE
- B) 231
- C) 179
- D) 186

33

- A) NO CHANGE
- B) those
- C) it
- D) each of them

Questions 34-44 are based on the following passage.

The Case of Vermeer and the Camera Obscura

It sometimes takes only one determined detective to get to the bottom of a great mystery. Consider, for instance, the case of Dutch artist Vermeer, who painted in the seventeenth century **34** -150 years before the advent of photography. Known for their astonishing realism, Vermeer's paintings have prompted speculation that perhaps the painter used an optical device to create such lifelike scenes. For years the question was bandied about without a resolution. Two books on the subject, one by architect Philip Steadman and the other by artist David Hockney, posited plausible theories that Vermeer relied on some kind of aid, **35** there was no way, however, to confirm these suspicions.

34

The writer is considering deleting the underlined portion and ending the sentence with a period. Should the underlined portion be kept or deleted?

- A) Kept, because it provides historical context central to understanding way Vermeer opted to paint scenes of middle class Dutch life rather than portraits of the aristocracy.
- B) Kept, because it provides support for the writer's subsequent description of the realism in Vermeer's paintings as "astonishing."
- C) Deleted, because it blurs the paragraph's focus on seventeenth-century Dutch painting by introducing an unrelated detail about photography.
- D) Deleted, because it disrupts the logical sequence of events recounted in the passage.

35

- A) NO CHANGE
- B) however, there was no way
- C) but there was no way
- D) there was no way

36 These theories have their critics: Tim Jenison, an engineer who loves puzzles and machinery. After reading 37 Hockney's and Steadman's books, Jenison became intrigued by the theory that Vermeer used a camera obscura, a prephotographic contraption consisting of, in its simplest form, a box that has a small hole in one side. As light shines through that hole, an upside-down image of the scene outside the hole is reflected on the box's interior surface that 38 are facing the hole. The reflected image, which can be manipulated with mirrors or lenses to be displayed on a sheet of paper or canvas, is true to the scene's colors and proportions. It's possible then to trace and otherwise used the projected image to guide the process of painting. Jenison set about trying to find out whether Vermeer had used such a device.

36

Which choice provides the most effective transition?

- A) NO CHANCE
- B) Suddenly, someone cracked the case wide open;
- C) Enter the detective;
- D) Until now, that is;

37

- A) NO CHANCE
- B) Hockney and Steadman's book
- C) Hockney and Steadman's books
- D) Hockney and Steadmans' book

38

- A) NO CHANCE
- B) were facing
- C) faces
- D) face

Jenison began by studying Vermeer obsessively: he visited **39** Delft, Holland (where Vermeer lived and painted) learned to read Dutch, and **40** became acquainted with Vermeer's paintings. Jenison built a model of a camera obscura so that he could **41** experiment with ways the painter may have used one.

39

- A) NO CHANGE
- B) Delft, Holland, where Vermeer lived and painted;
- C) Delft, Holland; where Vermeer lived and painted;
- D) Delft, Holland(where Vermeer lived and painted),

40

Which choice is most consistent with the statement made at the beginning of the sentence?

- A) NO CHANGE
- B) learned a bit about
- C) pored over
- D) familiarized himself with

41

- A) NO CHANGE
- B) perform experiment to uncover methods of the
- C) take an experimental approach to figuring out
- D) try out experiments to discover

After intense scrutiny of the colors and tones in the paintings, Jenison decided that Vermeer must have also used a mirror somehow to improve tonal precision. **42** To test out his idea, Jenison propped up a mirror in front of a black and white photo and, despite his lack of artistic training, managed to capture the image's light and shading in a near replica.

42

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

Vermeer was not considered particularly successful during his lifetime, but after the invention of photography, his paintings garnered critical acclaim.

Should the writer make this addition here?

- A) Yes, because it emphasizes the role the invention of photography had in the art world's reevaluation of Vermeer's work.
- B) Yes, because it provides support for the previous sentence's claim about how Vermeer achieved tonal precision.
- C) No, because it blurs the paragraph's focus on describing the numerous ways that Vermeer used mirrors to achieve realistic tonal precision in his paintings.
- D) No, because it interrupts the narrative sequence detailing the steps Jenison took to test out his theory about how Vermeer painted.

[1] Next, Jenison decided to tackle the reproduction of an actual Vermeer, choosing *The Music Lesson* as his subject. [2] He began with the Herculean task of staging the entire scene, which involved constructing the furniture, **43** harpsichord, stained glass- everything. [3] Then, using the camera obscura in combination with a mirror, Jenison painstakingly recreated the painting. [4] His experiments left Jenison feeling confident that Vermeer has used a camera obscura. [5] Others may still have their doubts, but this detective had found his answer. **44**

43

44

STOP

If you finish before time is called, you may check your work on this section only.

Do not turn to any other section.



Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

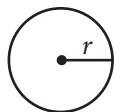
DIRECTIONS

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

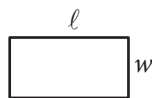
1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated,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

REFERENCE

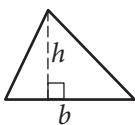


$$A = \pi r^2$$

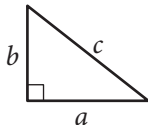
$$C = 2\pi r$$



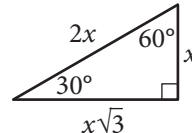
$$A = \ell w$$



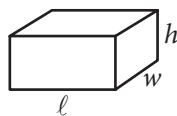
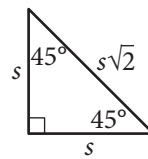
$$A = \frac{1}{2}bh$$



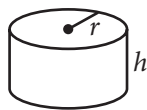
$$c^2 = a^2 + b^2$$



Special Right Triangles



$$V = \ell wh$$



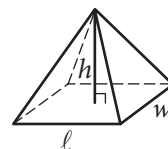
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

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

Which of the following is equivalent to $(x^2 - 4)^{\frac{3}{2}}$?

- A) $x^3 - 8$
- B) $(x - 2)^3$
- C) $\sqrt{(x^2 - 4)^3}$
- D) $(\sqrt[3]{x^2 - 4})^2$

2

The weight of an empty fish tank is 4 pounds. A gallon of water weighs approximately 8 pounds. Which of the following best approximates the total weight w , in pounds, of the fish tank and g gallons of water?

- A) $w = 8g$
- B) $w = 8g + 4$
- C) $w = 4g + 8$
- D) $w = 4g$

3

$$(3q + 7r)(q - 5r + 3)$$

Which of the following polynomials is equivalent to the expression above?

- A) $4q + 2r + 3$
- B) $3q^2 - 15qr + 9q + 7r$
- C) $3q^2 + 6q - qr - 12r^2 + 10r$
- D) $3q^2 + 9q - 8qr - 35r^2 + 21r$

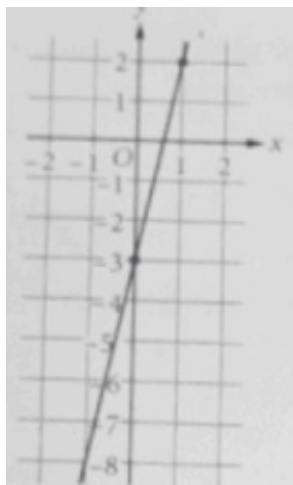
4

x	y
1	3
2	1
3	-1
4	-3
5	-5

The relationship between x and y is linear, and some values for the relationship are shown in the table above. When graphed in the xy -plane, the line that represents the relationship between x and y passes through the point $(-1, a)$. What is the value of a ?

- A) -1
- B) 5
- C) 7
- D) 9

5



Which of the following is the equation of a line that is perpendicular to the line graphed in the xy -plane above?

A) $y = -5x - 6$

B) $y = -\frac{1}{5}x - 3$

C) $y = \frac{1}{5}x - \frac{1}{3}$

D) $y = 5x - 6$

6

$$x = \sqrt{4x - 3}$$

What is the solution set to the equation above?

A) $\{1\}$

B) $\{3\}$

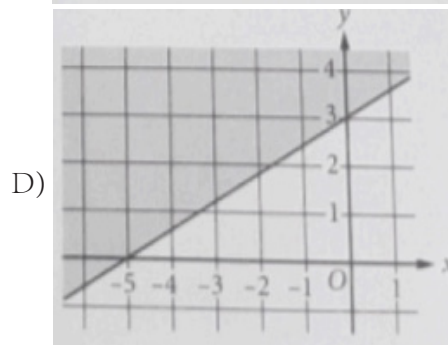
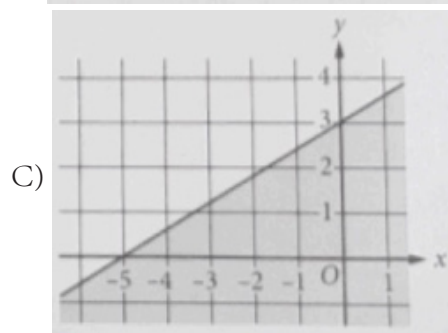
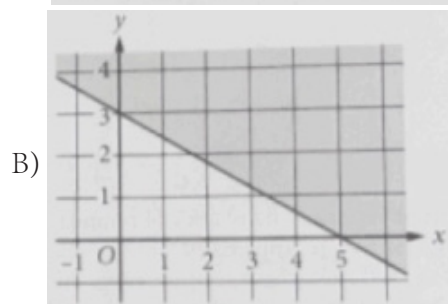
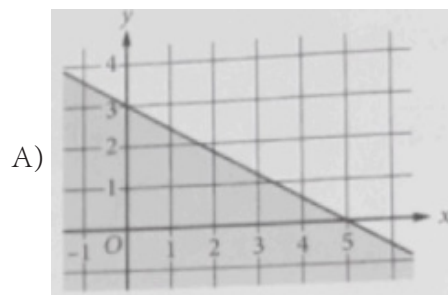
C) $\{0, 1\}$

D) $\{1, 3\}$

7

$$5y + 3x \leq 15$$

The solution set to the inequality above is represented by the line and shaded region of the graph in which of the following xy -planes?



8

A full box of cereal initially contains 28 ounces. If 2.4 ounces of cereal are eaten each day, which of the following represents the number of ounces of cereal, C , remaining in the box after d days?

- A) $C = -2.4d + 28$
- B) $C = -2.4d - 28$
- C) $C = 2.4d + 28$
- D) $C = 2.4d - 28$

9

A rectangle and a triangle have the same area. If the bases of the rectangle and the triangle are the same length, which of the following is true?

- A) The height of the triangle is one-half the height of the rectangle.
- B) The height of the triangle is equal to the height of the rectangle.
- C) The height of the triangle is twice the height of the rectangle.
- D) The height of the triangle is four times the height of the rectangle.

10

$$\sqrt{x^2 + 4(2x + 4)}$$

Which of the following is equivalent to the expression above, for all $x \geq -4$?

- A) $x + 4$
- B) $x + 8$
- C) $3x + 4$
- D) $5x + 8$

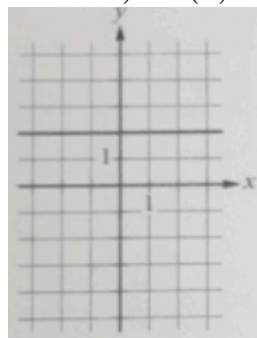
11

$$f(x) = x^2 - 1$$

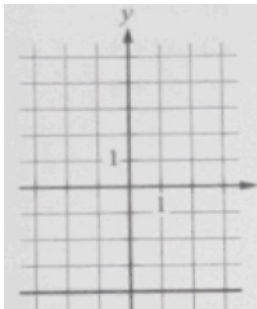
$$g(x) = -x^2 + 3$$

The functions f and g are defined above. Which of the following graphs in the xy -plane is the graph of $y = g(x) - f(x)$?

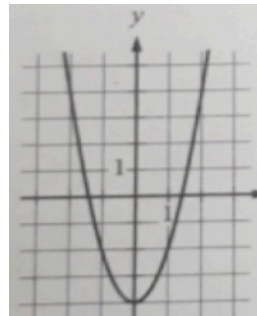
A)



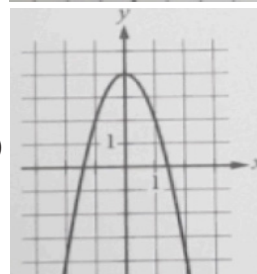
B)



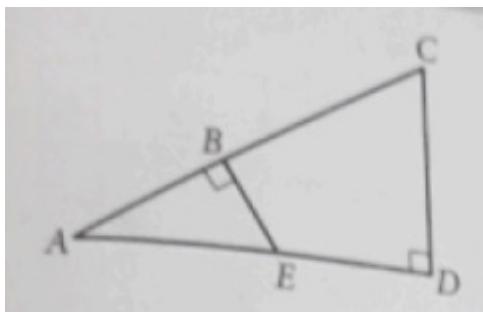
C)



D)



12



In the figure above, $CD=5$ and $AD=8$. What is the value of the cosine of $\angle AEB$?

- A) $\frac{5}{\sqrt{89}}$
- B) $\frac{8}{\sqrt{89}}$
- C) $\frac{5}{8}$
- D) $\frac{8}{5}$

13

$$c(t) = 1,870(1.025)^t$$

The function above models the number of capybaras, $c(t)$, living in a section of tropical forest in Brazil, where t is the number of years since 2010. Which of the following is the best interpretation of the value 1.025 in the context?

- A) Each year, the number of capybaras is increasing by approximately 1 from the preceding year.
- B) Each year, the number of capybaras is increasing by approximately 25 from the preceding year.
- C) Each year, the number of capybaras is increasing by approximately 2.5% from the preceding year.
- D) Each year, the number of capybaras is increasing by approximately 125% from the preceding year.

14

$$3ax + 4 = 6x + b$$

In the equation above, a and b are constants. If the equation has an infinite number of solutions, what is the value of $a + b$?

- A) 8
- B) 6
- C) 4
- D) 2

15

$$y = 3x^2 - kx$$

$$y = 4 - 2x$$

In the equation above, k is a constant. One point at which the graphs of the equations intersect in the xy -plane is $(n, 0)$, where n is a constant. What is the value of k ?

- A) -3
- B) 2
- C) 3
- D) 6

**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 $\begin{array}{|c|c|c|c|} \hline 3 & 1 & / & 2 \\ \hline \bullet & \bullet & \bullet & \bullet \\ \hline \end{array}$ is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
- 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. →

Grid in result. →

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

← Fraction line

Answer: 2.5

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

← Decimal point

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

	2	/	3
•	•	•	•
0	0	0	0
1	1	1	1
2	•	2	2
3	3	3	•
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8

.	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	•	•	•
7	7	7	7
8	8	8	8

.	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	•	•	•
7	7	7	•
8	8	8	8

Answer: 201 – either position is correct

	2	0	1
•	•	•	•
0	0	•	0
1	1	1	•
2	•	2	2
3	3	3	3

2	0	1	
•	•	•	•
0	•	0	0
1	1	•	1
•	2	2	2
3	3	3	3

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

16

If $-2x + 6 = -5x + 15$, what is the value of $x - 3$?

17

$$x - 2y = 3$$

$$2x - 2y = 8$$

The ordered pair (x, y) satisfies the system of equations above. What is the value of x ?

18

$$2x^2 + bx + 8 = 0$$

In the equation above, b is a constant. For what positive value of b does the equation have exactly one real solution?

19

If $\frac{2a}{3b} = \frac{1}{5}$, what is the value of $\frac{b}{a}$?

20

The product of the complex numbers $(2 + 3i)$ and $(3 - i)$ can be written as $a + bi$, where a and b are real numbers and $i = \sqrt{-1}$. What is the value of $100a + b$?



Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

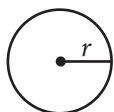
DIRECTIONS

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

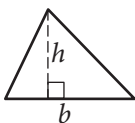


$$A = \pi r^2$$

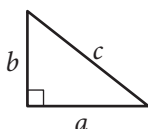
$$C = 2\pi r$$



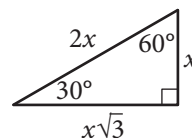
$$A = \ell w$$



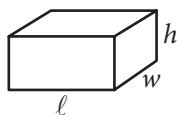
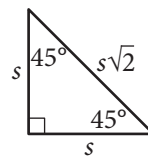
$$A = \frac{1}{2}bh$$



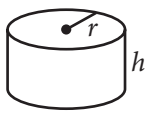
$$c^2 = a^2 + b^2$$



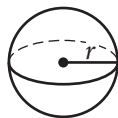
Special Right Triangles



$$V = \ell wh$$



$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

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

In the past, the US space program used rockoons, rockets that were lifted to a certain height by high-altitude balloons before the rocket was ignited. After being released from the ground, one rockoon was lifted by the balloons at a constant rate of 690 feet per minute. Approximately how many minutes did it take the rockoon to reach 38,000 feet?

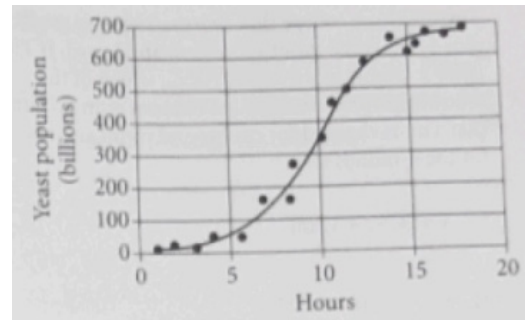
- A) 55
- B) 140
- C) 630
- D) 3,300

2

Erika works at a restaurant for an hourly rate during the week and delivers newspapers on Sundays. Last week, she worked at the restaurant for 3 hours on Thursday and 4 hours on Friday, and she didn't work any other day of the week at the restaurant. She also earned \$15 on Sunday for delivering newspapers. If Erika earned a total of \$78 from working at the restaurant and delivering newspapers last week, what is her hourly rate at the restaurant?

- A) \$ 7.00
- B) \$ 9.00
- C) \$ 11.14
- D) \$ 63.00

3



The scatterplot above shows the number of yeast cells, in billions, at various times during the first 18 hours after a population of yeast begins to grow. A logistical growth model (curve of best fit) is also shown. According to the curve, which of the following is closest to the number of yeast cells in the population, in billions, at the end of 20 hours?

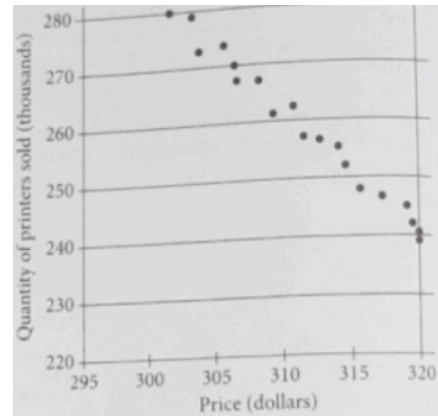
- A) 500
- B) 600
- C) 700
- D) 1,000

4

Tim attends a college that charges \$ 900 per credit plus \$ 1,000 each month for room and board. If Tim takes x credits in a 4-month term, which of the following represents the total amount y , in dollars, that Tim is charged for credits and room and board for the 4-month term?

- A) $y = 900x + 4,000$
 B) $y = 1,000x + 3,600$
 C) $y = 3,600x + 4,000$
 D) $y = \frac{900}{x} + 4,000$

5



The scatterplot above shows the number of printers, in thousands, sold at different prices. Based on the linear trend in the scatterplot, approximately how many printers would sell at a price of \$ 295?

- A) 220,000
 B) 250,000
 C) 275,000
 D) 300,000

6

$$p(x) = 3x^2 + 7$$

$$r(x) = 3x + 3$$

The functions p and r are shown above. Which of the following is equal to $p(x) + r(x)$?

- A) $9x + 10$
- B) $3x^2 + 3x + 7$
- C) $3x^2 + 3x + 10$
- D) $9x^3 + 9x^2 + 21x + 21$

7

Water flows into a basin at a rate of 1 cubic foot per second. At this rate, how many cubic feet of water will flow into the basin in one day?

- A) 1,440
- B) 28,800
- C) 86,400
- D) 259,200

8

The height $h(t)$, in feet, reached by a projectile t seconds after launch is described by the function

$h(t) = -16t^2 + 48t + 22$. What is the height, in feet, of the projectile 3 seconds after launch?

- A) 22
- B) 58
- C) 118
- D) 2,470

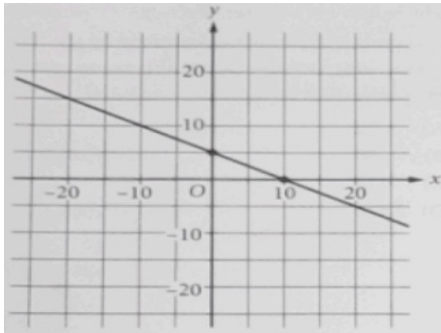
9

s	t
-5	0
0	5

A linear relationship exists between s and t , and the table above shows two pairs of values for them. Which of the following equations could be used to describe the relationship between s and t ?

- A) $t = -s - 5$
- B) $t = -s + 5$
- C) $t = s - 5$
- D) $t = s + 5$

10



Which of the following is an equation of the line graphed in the xy -plane above?

- A) $y = -\frac{1}{2}x + 10$
 B) $y = -\frac{1}{2}x + 5$
 C) $y = -2x + 10$
 D) $y = -2x + 5$

11

$$5px - 8 = 3px + 2$$

In the equation above, p is a constant. What is the value of $px - 5$?

- A) -10
 B) -5
 C) 0
 D) 2

12

Which of the following tables is consistent with the $f(x) = x^2 + 6x - 5$ function?

A)

x	-2	-1	0	1
$f(x)$	-19	-12	-5	2

B)

x	-2	-1	0	1
$f(x)$	-13	-10	-5	2

C)

x	-2	-1	0	1
$f(x)$	11	2	-5	-10

D)

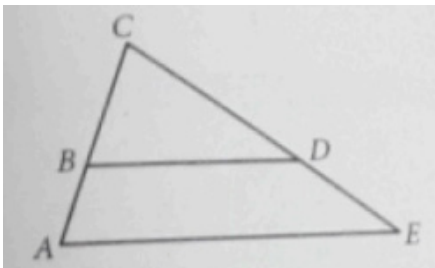
x	-2	-1	0	1
$f(x)$	-13	-10	-7	-4

13

A contract for a construction job states that if the job is not completed by the stated deadline, then the construction company will be fined a flat fee of \$ 1,000 as well as \$ 200 for each day the construction continues past the deadline. Which of the following equation types would best model this situation, where y is the total amount, in dollars, the company will be fined if construction continues x days beyond the deadline and a and b are constants?

- A) $y = abx$
- B) $y = a(b)^x$
- C) $y = a + (b)^x$
- D) $y = a + bx$

14



In $\triangle ACE$ above, $\overline{BD} \parallel \overline{AE}$. If $BD=19$ and $AE=31$,

what is the value of $\frac{CD}{DE}$?

- A) $\frac{19}{31}$
- B) $\frac{12}{19}$
- C) $\frac{19}{12}$
- D) $\frac{31}{19}$

15

If the speed of an airplane is now 127% of its previous speed, which of the following must also be true?

- A) The speed of the airplane has increased by 27% from its previous speed.
- B) The speed of the airplane has increased by 73% from its previous speed.
- C) The speed of the airplane is now 127 miles per hour.
- D) The speed of the airplane is now 27 miles per hour faster than its previous speed.

Questions 16 and 17 refer to the following information.

Number of Yellowstone National Park Camping Permits in 2013

quarter	Type of permit				Total
	tent	RV	backcountry	cabin or lodge	
First quarter	292	582	627	0	1,501
Second quarter	21,149	19,430	5,931	142,886	189,396
Third quarter	66,448	42,774	33,201	389,695	532,118
Fourth quarter	873	1,111	864	314	3,162
Total	88,672	63,897	40,623	532,895	726,177

The table above shows the 726,177 camping permits issued for Yellowstone National Park in 2013, categorized by type of permit and the quarter of the year for which the permit was issued.

16

In the quarter with the most permits issued in 2013, which of the following best approximates the ratio of backcountry permits to tent permits?

- A) 1:10
- B) 1:2
- C) 3:4
- D) 2:1

17

If a tent permit from Yellowstone National Park in 2013 is selected at random, which of the following best approximates the probability that the permit was issued for the third quarter?

- A) 0.12
- B) 0.37
- C) 0.73
- D) 0.75

18

$$P(x) = x^4 - 5x^3 - 5x + 6 + 4k$$

In the polynomial above, k is a constant. If $P(2) = -20$, what is the value of k ?

- A) -2
- B) 1.5
- C) 2
- D) 7

19

$$V_f = V_i + at$$

An object is accelerating at a constant rate. The equation above relates the object's initial velocity V_i , the constant acceleration a , the final velocity V_f and the time t . Which of the following equations expresses t in terms of V_i , V_f and a ?

A) $t = V_f - V_i + a$

B) $t = a(V_f - V_i)$

C) $t = \frac{V_f + V_i}{a}$

D) $t = \frac{V_f - V_i}{a}$

20

$$ax + by = c$$

$$\frac{a}{3}x + \frac{b}{2}y = \frac{c}{6}$$

In the system of linear equations shown above, a , b , and c are constants, and a and b are not equal to zero. Which of the following is true about the system of linear equations?

- A) It has no solutions.
- B) It has exactly one solution.
- C) It has exactly two solutions.
- D) It has infinitely many solutions.

Questions 21 and 22 refer to the following information.

$$J(x) = 1,950 + 35x$$

$$K(x) = 2,100 + 25x$$

Jana and Kora both estimated their town's present population and rate of growth. The functions J and K defined above represent, respectively, Jana's prediction and Kora's predictions of the population of their town x years after January 1, 2015.

21

During what year does Jana's function predict the town's population will become greater than 2,290?

- A) 2022
- B) 2024
- C) 2028
- D) 2032

22

In what year is the population predicted by Jana's function the same as the population predicted by Kora's function?

- A) 2028
- B) 2029
- C) 2030
- D) 2031

23

Each edge of a metal cube is 4 centimeters in length. If the metal cube has a mass of 172.8 grams, what is the density of the metal cube, in grams per cubic centimeter?

- A) 2.7
- B) 10.8
- C) 14.4
- D) 43.2

24

$$f(x) = -2x - 3$$

The function f is defined above. If $f(a) = 2$, what is the value of a ?

- A) -7
- B) $-\frac{5}{2}$
- C) 1
- D) $\frac{5}{2}$

25

Animal	Diameter of eyeball (millimeters)
Red-tailed hawk	12
Human	24

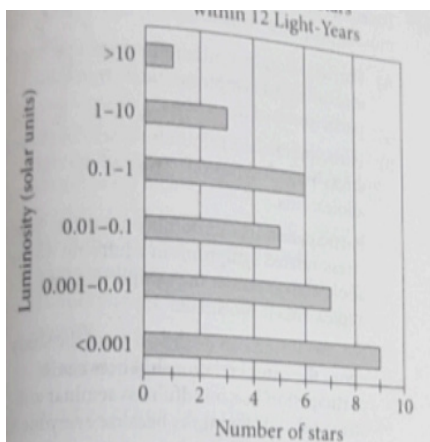
The table above shows the diameter of a red-tailed hawk eyeball and the diameter of a human eyeball. If both eyeballs are approximately spherical, the volume of the red-tailed hawk eyeball is approximately how many times the volume of the human eyeball? (The volume of a sphere with radius r is $\frac{4}{3}\pi r^3$?)

- A) $\frac{1}{8}$
- B) $\frac{1}{2}$
- C) $\frac{2}{3}$
- D) 8

26

The graph below shows the distribution of all stars within 12 light-years of Earth by total energy output per second, or luminosity.

Luminosity of Stars within 12 Light-Years



Which of the following could be the median luminosity of all the stars within 12 light-years of Earth?

- A) 0.18
- B) 0.052
- C) 0.0063
- D) 0.00063

27

Jasmine and Daniel are each conducting a survey among the 1,190 students at North High to determine the proportion of students who would be interested in a new after-school sports club. Jasmine randomly selected 100 students to survey, and Daniel randomly selected 50 students to survey. In both surveys, 34% of students indicated they are interested. If J represents the margin of error for Jasmine's sample proportion, D represents the margin of error for Daniel's sample proportion, and both students have the same amount of confidence in their results, which of the following is most likely true?

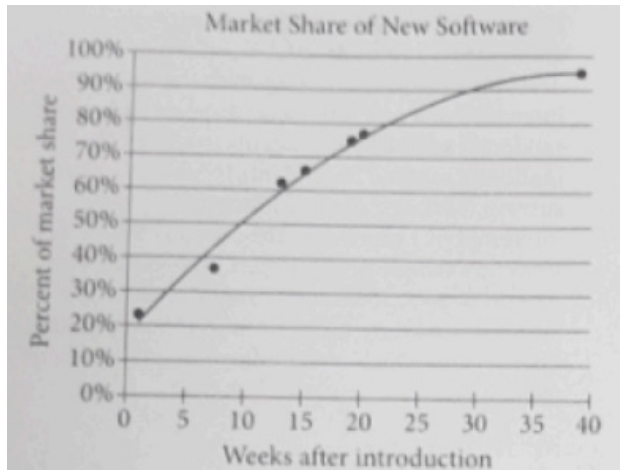
- A) $J < D$
- B) $J > D$
- C) $J = D$
- D) The relationship between J and D cannot be determined.

28

The function f is defined by $f(x) = x^2 + bx + c$, where b and c are constants. If the x -intercepts of the graph of f in the xy -plane are 3 and -1, what is the value of b ?

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

29



The scatterplot above shows the percent of market share, y , of a new version of software x weeks after its introduction. A curve of best fit is also shown. Which of the following could be an equation of the curve of best fit for the data?

- A) $y = 1.9x + 20.1$
- B) $y = -0.05x^2 + 4.0x + 16.5$
- C) $y = -0.02x^2 - 7.1x + 115.2$
- D) $y = 45.6(1.01)^x$

30

In a study of 24 adults and 8 adolescents, all participants took an 8-week mindfulness seminar. After the seminar concluded, the participants reported improvement in stress-related symptoms. Based on the study, which of the following is the most appropriate conclusion?

- A) Participation in a mindfulness seminar improves stress-related symptoms but only in the participants of this study.
- B) Participation in a mindfulness seminar improves stress-related symptoms in all adults and adolescents.
- C) Participation in a mindfulness seminar improves stress-related symptoms in adults but not in adolescents because the sample size for adolescents is too small.
- D) No conclusion can be drawn from the study about the causal relationship between participation in a mindfulness seminar and stress-related symptoms because everyone in the study took the seminar.

**DIRECTIONS**

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

3	1	/	2
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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

 is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
- 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.

Write answer in boxes. →

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

← Fraction line

Grid in result.

7	/	1	2
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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: 2.5

← Decimal point

2	.	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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

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

2	/	3
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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.

31

There are 16 full cartons of eggs in 2 full crates, and each full carton contains 12 eggs. How many eggs are needed to fill 11 crates?

32

If $(x-2)^2 = 4(x-2)$, what is one possible value of x ?

33

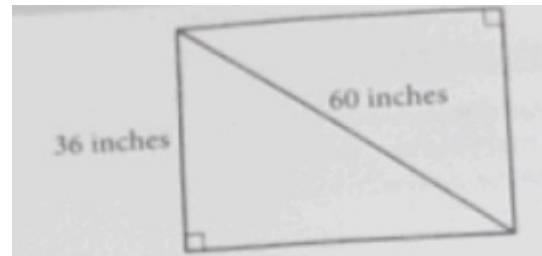
In a group of 400 people, 46% are adults and the rest are children. How many more children than adults are in the group?

34

$$2\left(x + \frac{b}{2} - 2\right) = 2x$$

In the equation above, b is a constant. For what value of b is the equation true for all values of x ?

35



A video screen has a height of 36 inches and a diagonal length of 60 inches, as shown in the figure above. What is the area, in square inches, of the video screen?

36

Pages	Total paid
9	\$ 308
12	\$ 341
15	\$ 374
18	\$ 407

The table above shows the total amount of money m , in dollars, a comic book artist is paid for completing a project consisting of p pages. The formula

$m = rp + k$ shows the relationship between the variables m and p , where r is the amount of money, in dollars, paid per page and k is the one-time fee the artist is paid for the project. What is the value of r ?

Questions 37 and 38 refer to the following information.

Census blocks are geographic areas defined by the US Census Bureau. The residents in each block are counted each decade. The table below shows the total number of census blocks for the 5 states that had the most census blocks in 2000 and 2010.

State	Number of census blocks in 2000	Number of census blocks in 2010
Alaska	21,874	45,292
Hawaii	18,990	25,016
Delaware	17,483	24,115
Rhode Island	21,023	25,181
Vermont	24,824	32,580
Total for these 5 states	104,194	152,184

37

What was the percent increase in the number of census blocks in Delaware from 2000 to 2010, rounded to the nearest tenth of a percent? (Disregard the % sign when gridding your answer. For example, if your answer is 78.2%, grid 78.2)

38

For these 5 states, what is the difference in the mean of the number of census blocks in 2010 and the mean of the number of census blocks in 2000?

STOP

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

As you read the passage below, consider how Tansy E Hoskins 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.

Adapted from Tansy E Hoskins, “Op-Ed | *The Trouble with Second-Hand Clothes*” © 2013 by *The Business of Fashion*. Originally published in *The Business of Fashion*, November 10, 2013

- 1 LONDON, United Kingdom—American rapper Macklemore's hugely popular anthem "Thrift Shop," which has been viewed over 450 million times on YouTube, is a cheeky tribute to the joys of shopping on the cheap, featuring mountains of second-hand coats, sweaters, jackets, jeans, jumpsuits, dresses, shoes and shirts.
- 2 On the surface, the recycling of used clothes, often charitably donated, means old garments don't go to waste, while new owners get a bargain. It seems like a "win-win" situation that couldn't be more ethically sound. And as the Christmas season approaches, millions of Westerners will soon flock to charity shops to donate their second-hand clothes.
- 3 But on closer inspection, the reselling of clothes is more complex than one might think, posing difficult questions for those hoping to do good by donating their old clothes.
- 4 Contrary to its homespun image, the second-hand clothing industry is dominated by what Dr Andrew Brooks and Prof David Simon at the University of London have called "hidden professionalism." The majority of donated clothing is sold to second-hand clothing merchants, who sort garments, then bundle them in bales for resale, usually outside the country in which the clothing was originally donated.
- 5 One key market is sub-Saharan Africa, where a third of all globally donated clothes are sold. In a paper entitled "Unravelling the Relationships between Used-Clothing Imports and the Decline of African Clothing Industries," Brooks and Simon quote a representative of UK-based anti-poverty organisation Oxfam Wastesaver, who states that 300 bales of second-hand clothing can be sold in Africa for around £25,000 (about \$40,000 at current exchange rates), while transport costs are just £2,000. Even taking into account the costs of things like collection and processing, these numbers suggest that the selling of second-hand clothing can be a lucrative affair, especially as the clothing being sold has often been charitably donated for free. While exact figures are scarce, in 2009, used clothing exports from OECD countries were worth \$1.9 billion, according to the United Nations Commodity Trade Statistics Database.

- 6 But it's not just the "hidden professionalism" of the used clothing business—and the resulting gap between costs and resale prices—that hurts markets like sub-Saharan Africa. The flood of castoffs collected via second-hand clothing schemes (along with the rise of cheap Chinese apparel imports) have also helped to undermine Africa's own fledgling textiles and clothing manufacturing industry, says Cambridge economist Ha-Joon Chang.
- 7 The second-hand clothing market has a negative impact in donor markets, as well. Consumers in the global North throw away vast quantities of clothing every year. In the UK, for example, people dump 1.4 million tonnes of clothing into landfills, annually. To combat dumping, charities and local governments have increasingly instituted clothing recycling programmes. But, ultimately, recycling tackles the symptom not the cause—and gives consumers a false sense of security that the rate at which they are consuming and disposing of clothing is at all sustainable.
- 8 The truth is, "fast fashion" is a deeply unsustainable model. And by emphasising recycling rather than tackling the root cause of why people continue to buy and dispose of larger and larger quantities of lighter, thinner and less well-made clothing, consumers are reassured that they can continue shopping as normal.
- 9 "There is now this notion that fashion is just a commodity, and that we are just consumers," laments Dilys Williams, director of the Centre for Sustainable Fashion at the London College of Fashion. "It doesn't do justice to us or to fashion. Fashion should be about cherishing clothes and creating an identity, [but today it's] based on constant adrenalin and the excitement of purchasing. There is no anticipation or dreaming. Nothing lasts or is looked after. We each have a mini-landfill in our closets."
- 10 But why stop and think when the charity shop or recycling bank is there to take care of the mess?

Write an essay in which you explain how Tansy E Hoskins builds an argument to persuade her audience that "second-hand clothes are harmful". In your essay, analyze how Tansy uses one or more of the features listed in the box above (or features of your own choice) to strengthen the logic and persuasiveness of her argument. Be sure that your analysis focuses on the most relevant features of the passage.

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

2017 年 12 月新 SAT 亚太卷答案



Reading				Writing			
题号	答案	题号	答案	题号	答案	题号	答案
1	C	41	B	1	D	41	A
2	B	42	D	2	B	42	C
3	C	43	B	3	B	43	A
4	D	44	B	4	C	44	C
5	C	45	A	5	D		
6	A	46	A	6	C		
7	B	47	B	7	D		
8	B	48	D	8	D		
9	C	49	C	9	A		
10	D	50	A	10	A		
11	C	51	B	11	C		
12	B	52	D	12	B		
13	A			13	C		
14	A			14	A		
15	B			15	B		
16	D			16	C		
17	C			17	A		
18	B			18	D		
19	A			19	B		
20	D			20	A		
21	D			21	B		
22	C			22	A		
23	B			23	D		
24	A			24	D		
25	D			25	C		
26	A			26	A		
27	C			27	D		
28	D			28	A		
29	C			29	B		
30	C			30	D		
31	D			31	B		
32	D			32	B		
33	C			33	C		
34	D			34	B		
35	C			35	C		
36	B			36	B		
37	B			37	A		
38	A			38	C		
39	A			39	D		
40	C			40	D		