CollegeBoard SAT®

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US

The SAT®

Test Book

IMPORTANT REMINDERS

1

A No. 2 pencil is required for the test. Do not use a mechanical pencil or pen.

2

Sharing any questions with anyone is a violation of Test Security and Fairness policies and may result in your scores being canceled.

Test begins on the next page.

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 Chitra Banerjee Divakaruni, *Before We Visit the Goddess*. ©2016 by Chitra Banerjee Divakaruni. It is 1973, and Bela and Sanjay have recently moved to the United States. Bishu, Sanjay's friend and mentor since childhood, helped arrange their move.

Bela was grateful to Bishu, she really was. But she couldn't help being annoyed that Bishu felt entitled to drop in unannounced for dinner whenever he wanted.

"Ah, good, solid Bengali food, Bela," he would say with an appreciative belch once he had finished eating. "That fried fish was quite fine. But the cauliflower curry could have done with a little more coriander." She resented him, too, for continuing to advise Sanjay about his career, though Sanjay now made more money than he did. She hated how, at such times, Sanjay, though otherwise masterful (just last week he had fought with a neighbor who had parked in their spot, making him remove his car), regressed into a teenagerish deference. *Yes, Bishu-da, you're right, Bishu-da, I should be careful about what I say to my supervisor.*

This night, once he had caught his breath, Bishu said, "We have some great news for you, Bela!"

Bela looked at her husband. *Why*, she asked in wordless husband-wife code, *didn't you tell me this great news? Why do I have to hear it from a stranger?*

Bishu-da isn't a stranger, he coded back with a frown.

"You tell her, Shonu," Bishu offered regally.

A boyish grin split open Sanjay's face. "We're buying a house!"

The words swooshed around in Bela's head like wild birds. That was her secret dream: a house of her own. She had lived in a house only once, in her childhood, a magical sprawling place in Assam with giant hydrangea bushes that leaned up against the walls. Her father was still alive then; she remembered walking with him in the mango grove, gathering golden fruit from the ground. Was that why she wanted a house so badly? She hadn't told Sanjay because it was an unreasonable longing, with her earning only minimum wage, and loans, so many of them.

"Bishu-da found us an excellent deal," Sanjay said, handing her a blurry photo. "Look!"

She thought the shingle-roofed tract home was the most beautiful house she had seen. She traced, with a shaky finger, the narrow front window, the line of the roof, the wood fence. She imagined herself cooking in a kitchen with new flooring and enough shelves so her spices and dals didn't have to be piled in untidy heaps on the counter. She would sit with Sanjay at the dining table drinking tea on a Sunday morning, and look out at the backyard where she had planted gardenias.

"We can't afford it," she said flatly, though she couldn't bear to hand the photo back to him.

CONTINUE

"It isn't to live in, silly." Bishu was avuncular in his kindness. "It's an investment. We're pooling our savings for the down payment. We'll rent it out. The rent will cover the monthly mortgage. Property values increase fast in the Bay Area. In a few years we can sell it, or take out a second mortgage and buy another home."

All through dinner, the men discussed the things they'd have to do: negotiate with the realtor, who was known to Bishu, and bring down the price; get the loan—thank goodness Bishu knew an agent, because otherwise they wouldn't qualify; advertise for a tenant. The house needed new carpets; the rooms had to be painted so they could charge more rent. They could do the painting themselves, couldn't they, and save money? Their voices were excited and self-assured and conspiratorial, the way they used to be in India, when they were political leaders.

Immersed in her own plans, Bela heard only snippets. As she carried dishes back and forth from the kitchen, she glanced at the photo, which she had propped up on the counter, and which she would paste, afterward, into the album where she was accumulating—slowly, because film was expensive—Polaroids of their American life. She had seen an announcement at Lucky's a couple days back. They needed shelf stockers. She could get on a late shift, after her stint at Tiny Treasures. Save the entire amount. When she had enough, she would hand it triumphantly to Sanjay and insist that he buy out Bishu. Finally, then, she would have a house of her own.

1

The narrator indicates that Bela perceives Sanjay as

A) yielding too readily to Bishu's guidance in professional matters.

B) showing too little ambition to move forward in his profession.

C) choosing to be somewhat secretive about his plans for the house.

D) allowing Bishu to distract him from important chores at home.

2

Which choice provides the best evidence for the idea that Bela is able to quickly communicate her feelings to Sanjay?

A) Lines 11-15 ("She hated . . . deference")

B) Lines 15-17 ("*Yes, Bishu-da . . . supervisor*")

C) Lines 20-24 ("*Why*, she . . . frown")

D) Lines 25-27 ("You tell . . . house")

3

Bishu's remarks concerning Bela's cooking primarily serve to

A) highlight the extent to which Bela depends on him for advice.

B) demonstrate the freedom he feels in his friends' home.

C) suggest that he lacks refinement in his manners when eating.

D) indicate that he has fond memories of Bela's cooking in India.

4

The comparison in lines 28-29 ("The words . . . birds") has the main effect of

A) hinting at Bela's excitement at the prospect of living in the countryside.

B) conveying Bela's immediate suspicion of Bishu's motives.

C) representing Bela's anxiety that her hopes will never be realized.

D) highlighting the intensity of Bela's unexpected joy.

CONTINUE

5

It can reasonably be inferred from the passage that Bela's initial thoughts about Sanjay's announcement are prompted by her

A) memories of a cherished time in the past.

B) knowledge that her father would approve of her owning a house.

C) longing to return to the security of her childhood.

D) skepticism regarding Bishu's skills as a businessman.

6

As used in line 37, "unreasonable" most nearly means

A) excessive.

B) unrealistic.

C) moody.

D) unusual.

7

According to the passage, Bela objects to the plan of buying a house because

A) Bishu will probably want to live in the house too.

B) the house in the photograph does not resemble her childhood home.

C) she resents that Bishu made the decision without first consulting Sanjay.

D) she and Sanjay lack the necessary funds.

8

It can reasonably be inferred from the passage that Sanjay and Bishu believe their chances of purchasing a house will be helped by

A) their willingness to make repairs to the house themselves.

B) the strength of the real estate market where they live.

C) Bishu's connections within the local business community.

D) the skills both men developed as political leaders in India.

9

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

A) Lines 55-60 ("We're . . . home")

B) Lines 61-66 ("All through . . . tenant")

C) Lines 66-69 ("The house . . . money")

D) Lines 69-71 ("Their . . . leaders")

10

What is the main purpose of the last paragraph of the passage?

A) To describe how Bela's preoccupation with her thoughts keeps her from sharing the others' excitement

B) To provide a concrete example of Bela's ability to save money by limiting costly luxuries

C) To explain why Bela's resentment about Bishu's interference begins to outweigh her gratitude for his generosity

D) To outline Bela's emerging strategy for achieving her dream to live in her own house

CONTINUE

Questions 11-20 are based on the following passage.

This passage is adapted from Pope Leo XIII, *Rerum Novarum*. Originally published in 1891.

[I]t has come to pass that working men have been surrendered, isolated and helpless, to the hardheartedness of employers and the greed of unchecked competition. The mischief has been increased by rapacious usury,[1] which, although more than once condemned by the Church, is nevertheless, under a different guise, but with like injustice, still practiced by covetous and grasping men. To this must be added that the hiring of labor and the conduct of trade are concentrated in the hands of comparatively few; so that a small number of very rich men have been able to lay upon the teeming masses of the laboring poor a yoke little better than that of slavery itself.

To remedy these wrongs the socialists, working on the poor man's envy of the rich, are striving to do away with private property, and contend that individual possessions should become the common property of all, to be administered by the State or by municipal bodies. They hold that by thus transferring property from private individuals to the community, the present mischievous state of things will be set to rights, inasmuch as each citizen will then get his fair share of whatever there is to enjoy. But their contentions are so clearly powerless to end the controversy that were they carried into effect the working man himself would be among the first to suffer. They are, moreover, emphatically unjust, for they would rob the lawful possessor, distort the functions of the State, and create utter confusion in the community.

It is surely undeniable that, when a man engages in remunerative labor, the impelling reason and motive of his work is to obtain property, and thereafter to hold it as his very own. If one man hires out to another his strength or skill, he does so for the purpose of receiving in return what is necessary for the satisfaction of his needs; he therefore expressly intends to acquire a right full and real, not only to the remuneration, but also to the disposal of such remuneration, just as he pleases. Thus, if he lives sparingly, saves money, and, for greater security, invests his savings in land, the land, in such case, is only his wages under another form; and, consequently, a working man's little estate thus purchased should be as completely at his full disposal as are the wages he receives for his labor. But it is precisely in such power of disposal that ownership obtains, whether the property consist of land or chattels. Socialists, therefore, by endeavoring to transfer the possessions of individuals to the community at large, strike at the interests of every wage-earner, since they would deprive him of the liberty of disposing of his wages, and thereby of all hope and possibility of increasing his resources and of bettering his condition in life.

What is of far greater moment, however, is the fact that the remedy they propose is manifestly against justice. For, every man has by nature the right to possess property as his own. This is one of the chief points of distinction between man and the animal creation, for the brute has no power of self direction. . . . It is the mind, or reason, which is the predominant element in us who are human creatures; it is this which renders a human being human, and distinguishes him essentially from the brute. And on this very account—that man alone among the animal creation is endowed with reason—it must be within his right to possess things not merely for temporary and momentary use, as other living things do, but to have and to hold them in stable and permanent possession; he must have not only things that perish in the use, but those also which, though they have been reduced into use, continue for further use in after time.

[1] The lending of money at an excessively high interest rate

CONTINUE

11

Based on the passage, Leo XIII would be most likely to agree that the economic conditions of his era attest to which basic relationship?

A) Modifications to the laws regulating the economy heighten tensions between employers and workers.

B) Social inequality worsens as the economy increasingly comes under the control of a select group of businesspeople.

C) Competition between businesses in a particular sector of the economy influences the morale of the workers in that sector.

D) Measures meant to protect workers from economic exploitation have the unintended effect of encouraging such exploitation.

12

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

A) Lines 1-4 ("It has . . . competition")

B) Lines 4-8 ("The . . . men")

C) Lines 8-14 ("To this . . . itself")

D) Lines 15-20 ("To remedy . . . bodies")

13

As used in line 19, "common" most nearly means

A) shared.

B) inferior.

C) typical.

D) frequent.

14

According to Leo XIII, the desire to acquire property prompts individuals to

A) feel envious of others' possessions.

B) seek work from an employer.

C) view work as more dignified than they otherwise would

D) resist sources of short-lived gratification.

15

In line 45, the phrase "little estate" most directly refers to the

A) land or other property owned by a wage earner.

B) status of a wage earner within the community.

C) neighborhoods where wage earners typically live.

D) standard amount of pay that a wage earner receives.

CONTINUE

16

It can reasonably be inferred from the passage that Leo XIII views socialism as being threatening because it

A) discourages disempowered groups from seeking greater recognition in society.

B) contributes to widespread discontent over the pace of societal change.

C) decreases the individual's willingness to make sacrifices benefiting society as a whole.

D) endangers certain conventions and institutions that are indispensable to society.

17

According to Leo XIII, what is one essential aspect of the concept of private property?

A) The ease with which land holdings can be exchanged for other forms of property

B) The belief that people can amass a great deal of property through living frugally

C) The freedom of property holders to determine what to do with their property

D) The likelihood that those who purchase property will profit from its resale

18

Leo XIII implies that those who wish to abolish the ownership of private property fail to recognize that such ownership is beneficial in that it

A) promotes a single set of values among the wealthy and the working class alike.

B) provides members of the working class a means to improve their circumstances.

C) induces workers to feel content with the compensation they receive for their labor.

D) helps to ensure that the various social classes live in harmony with one another.

19

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

A) Lines 20-24 ("They . . . enjoy")

B) Lines 25-28 ("But their . . . suffer")

C) Lines 32-35 ("It is . . . own")

D) Lines 50-56 ("Socialists . . . life")

20

In the last paragraph, the discussion of "animal creation" serves mainly to

A) assert a central difference between humans and animals.

B) underscore humans' responsibilities toward animals.

C) consider humans' right to keep animals as property.

D) draw attention to the basic needs of humans and animals.

CONTINUE

Questions 21-31 are based on the following passage and supplementary material.

This passage is adapted from Matthew Savoca, "The Oceans Are Full of Plastic, but Why Do Seabirds Eat It?" ©2016 by The Conversation US, Inc.

Pioneering research by Dr. Thomas Grubb Jr. in the early 1970s showed that tube-nosed seabirds use their powerful sense of smell, or olfaction, to find food effectively, even when heavy fog obscures their vision. Two decades later, Dr. Gabrielle Nevitt and colleagues found that certain species of tube-nosed seabirds are attracted to dimethyl sulfide (DMS), a natural scented sulfur compound. DMS comes from marine algae, which produce a related chemical called DMSP inside their cells. When those cells are damaged—for example, when algae die, or when marine grazers like krill eat it—DMSP breaks down, producing DMS. The smell of DMS alerts seabirds that food is nearby—not the algae, but the krill that are consuming the algae.

Dr. Nevitt and I wondered whether these seabirds were being tricked into consuming marine plastic debris because of the way it smelled. To test this idea, my coauthors and I created a database collecting every study we could find that recorded plastic ingestion by tube-nosed seabirds over the past 50 years. This database contained information from over 20,000 birds of more than 70 species. It showed that species of birds that use DMS as a foraging cue eat plastic nearly six times as frequently as species that are not attracted to the smell of DMS while foraging.

To further test our theory, we needed to analyze how marine plastic debris smells. To do so, I took beads of the three most common types of floating plastic—polypropylene and low- and high-density polyethylene—and sewed them inside custom mesh bags, which we attached to two buoys off of California's central coast. We hypothesized that algae would coat the plastic at sea, a process known as biofouling, and produce DMS.

After the plastic had been immersed for about a month at sea, I retrieved it and brought it to a lab that is not usually a stop for marine scientists: the Robert Mondavi Institute for Food and Wine Science at UC Davis. There we used a gas chromatograph, specifically built to detect sulfur odors in food products, to measure the chemical signature of our experimental marine debris. Sulfur compounds have a very distinct odor; to humans they smell like rotten eggs or decaying seaweed on the beach, but to some species of seabirds DMS smells delicious!

Sure enough, every sample of plastic we collected was coated with algae and had substantial amounts of DMS associated with it. We found levels of DMS that were higher than normal background concentrations in the environment, and well above levels that tube-nosed seabirds can detect and use to find food. These results provide the first evidence that, in addition to looking like food, plastic debris may also confuse seabirds that hunt by smell.

Our findings have important implications. First, they suggest that plastic debris may be a more insidious threat to marine life than we previously believed. If plastic looks and smells like food, it is more likely to be mistaken for prey than if it just looks like food.

Second, we found through data analysis that small, secretive burrow-nesting seabirds, such as prions, storm petrels, and shearwaters, are more likely to confuse plastic for food than their more charismatic, surface-nesting relatives such as albatrosses. This difference matters because populations of hard-to-observe burrow-nesting seabirds are more difficult to count than surface-nesting species, so they often are not surveyed as closely. Therefore, we recommend increased monitoring of these less charismatic species that may be at greater risk of plastic ingestion.

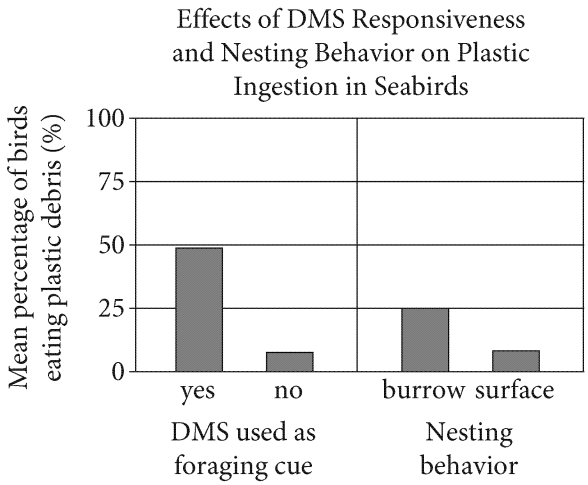
Figure 1

Mean DMS Concentrations in Plastic Debris after Immersion at Sea

	Mean DMS concentration (micrograms DMS per gram plastic)		
	High-density polyethylene	Low-density polyethylene	Polypropylene
Buoy location 1	13.45	11.76	4.99
Buoy location 2	3.16	6.05	14.13
Overall	8.31	8.90	9.56

CONTINUE

Figure 2



Figures adapted from Matthew S. Savoca et al., "Marine Plastic Debris Emits a Keystone Infochemical for Olfactory Foraging Seabirds." ©2016 by Matthew S. Savoca et al.

21

According to the passage, the ability to detect DMS is useful to seabirds because DMS

A) suggests the presence of large amounts of plastic debris.

B) facilitates seabirds' ability to navigate in heavy fog.

C) indicates that concentrations of algae are especially high.

D) signals to seabirds that populations of krill are nearby.

22

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

A) included.

B) controlled.

C) limited.

D) accommodated.

23

It can reasonably be inferred from the passage that prior to the studies conducted by the author and Nevitt, research on tube-nosed seabirds must have identified the

A) minimum DMS level that tube-nosed seabirds can smell.

B) minimum DMS level that can result from biofouling.

C) maximum amount of algae that can coat a plastic surface.

D) maximum amount of plastic that can be safely consumed by a tube-nosed seabird.

24

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

A) Lines 41-44 ("There . . . debris")

B) Lines 48-50 ("Sure . . . with it")

C) Lines 50-53 ("We found . . . food")

D) Lines 54-56 ("These . . . by smell")

25

According to the author, the research he did with Nevitt is valuable because the results indicate that

A) seabirds only recently acquired the ability to identify food through the use of olfaction as a foraging cue.

B) the scientific community may have underestimated the danger plastic poses to seabirds.

C) some populations of surface-nesting seabirds are declining.

D) the process by which plastic becomes biofouled may be reversible with the right treatment.

CONTINUE

26

Which choice best supports the conclusion that a factor other than the presence of DMS can mislead seabirds into consuming plastic?

A) Lines 60-62 ("If . . . food")
B) Lines 63-68 ("Second . . . albatrosses")
C) Lines 68-72 ("This . . . closely")
D) Lines 72-74 ("Therefore . . . ingestion")

27

The author's discussion of burrow-nesting seabirds in the last paragraph primarily serves to

A) answer a question raised earlier in the passage about why seabirds consume debris.
B) present contributions from other scientists doing similar research on seabirds.
C) describe a new design for future research into the feeding habits of seabirds.
D) support a claim that certain types of seabirds should be observed with more scrutiny.

28

As used in line 71, "surveyed" most nearly means

A) judged.
B) polled.
C) tracked.
D) explored.

29

Which statement about the data presented in figure 1 is best supported by the passage?

A) Concentrations of DMS on the polypropylene debris would have been highest at the end of the one-month period in both buoy locations.
B) Surface-nesting seabirds would likely have spent more time foraging near buoy location 2 than they would have spent foraging near buoy location 1.
C) The sulfur odor of the polypropylene debris at buoy location 1 would have been stronger than the sulfur odor of the low-density polyethylene debris at that location.
D) DMS-sensitive seabirds foraging near buoy location 2 would have been more likely to seek out the polypropylene debris than the high-density polyethylene debris at that location.

30

According to figure 2, what is the approximate mean percentage of seabirds found eating plastic debris that use DMS as a foraging cue?

A) 0%
B) 25%
C) 50%
D) 75%

31

According to figure 1, which buoy location and type of plastic had the highest concentration of DMS?

A) Buoy location 1; high-density polyethylene
B) Buoy location 2; low-density polyethylene
C) Buoy location 1; polypropylene
D) Buoy location 2; polypropylene

CONTINUE

Questions 32-42 are based on the following passage and supplementary material.

This passage is adapted from David Rotman, "It Pays to Be Smart." ©2017 by MIT Technology Review.

Our economy is increasingly ruled by a few dominant firms. We see them everywhere, from established giants Amazon, Facebook, Google, Apple, and Walmart to fast-growing newcomers like Airbnb, Tesla, and Uber. There have always been large companies and outright monopolies, but there's something distinctive about this new generation of what some economists call superstar companies. They appear across a broad range of business sectors and have gained their power at least in part by adeptly anticipating and using digital technologies that foster conditions where a few winners essentially take all.

According to recent research by economists at Harvard and MIT, the share of sales by superstar companies—which the authors define as the four largest firms in a given industry—has gone up sharply in all the sectors they looked at, from transportation to services to finance. The trend toward superstar firms is accelerating, says Lawrence Katz, a Harvard economist and coauthor of the study. It has become more uniform across industries and developed economies during the past decade or so. These companies' dominance is particularly strong in markets undergoing rapid technological change. Katz says that's probably because of the wide disparity in how well companies take advantage of new advances. In other words, you have to be the smartest company in your field or you might as well not bother.

In itself, that might not be bad. But the authors identified a deeply troubling result of an economy where just a few top-tier companies dominate. One of the economic truths of much of the 20th century was that the portion of the country's overall income that went to labor was constant; as the economy grew, workers got a proportionate share of that growing pie. But labor's share of the national income has been shrinking over the past few decades. This is true in many countries, and the decline speeded up in the United States in the 2000s.

The trend puzzles economists. Some suggest it reflects the rise of cheap robots that can do the jobs of human workers, but the data isn't convincing. Instead, Katz and his coauthors blame the emergence of the superstar companies. As these companies grow and become more efficient and more adept at using digital technologies, they need fewer workers relative to their soaring revenues. The fact that these labor-frugal firms have so much of the market share in their sectors means labor gets a smaller portion of the nation's overall income.

The rise of the superstar companies also might help explain another disturbing economic trend. Despite the proliferation of impressive new advances in software, digital devices, and artificial intelligence over the last decade and the great profits generated by Silicon Valley, economic growth in the United States and other developed countries has been sluggish. In particular, an economic measure called total factor productivity,[1] which is meant to reflect innovation, has been dismal. How can overall growth be so lackluster while the high-tech sector is booming?

Economists with the Organization for Economic Cooperation and Development (OECD) think they have found the answer. It turns out that productivity at the top companies in various sectors—what the OECD economists call the frontier firms—is growing robustly. These are the companies making the best use of the Internet, software, and other technologies to streamline their operations and create new market opportunities. But most companies aren't actually harnessing new technologies very effectively. And the relatively poor productivity of these laggards, says Australian OECD economist Dan Andrews, is dragging down the overall economy.

[1] Portion of output that's not explained by the amount of inputs used in production

CONTINUE

Figure 1

Change in Total Factor Productivity since 2001, Manufacturing Sector

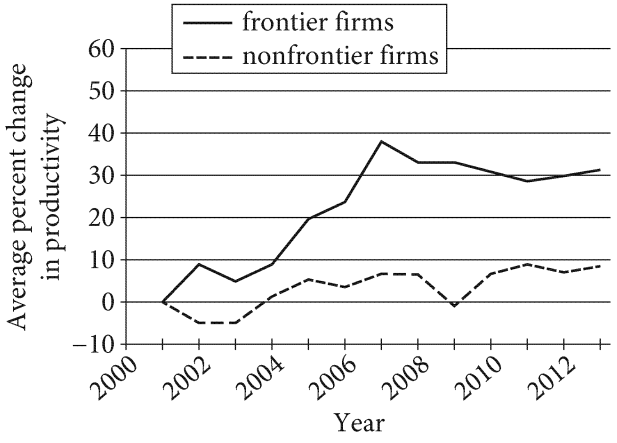
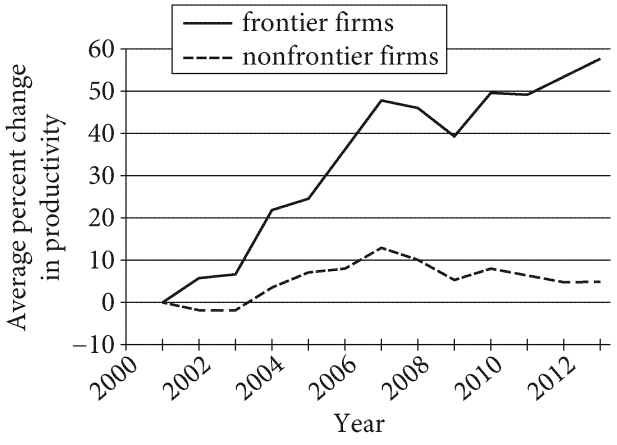


Figure 2

Change in Total Factor Productivity since 2001, Business Services Sector



Figures adapted from Dan Andrews, Chiara Criscuolo, and Peter N. Gal, "The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy." ©2016 by OECD.

32

A central idea in the passage is that successful sectors of the modern economy

A) include only companies that are willing to use innovative technologies.

B) have experienced a shift toward the centralization of power by a few companies.

C) are forecasted to experience faster labor growth than other sectors.

D) have access to greater resources than other sectors.

33

The author of the passage develops his argument primarily by

A) analyzing the effect of technological advances on future market trends.

B) examining the process by which one company became a leader in its industry.

C) comparing historical national labor data to that of present national labor data.

D) presenting research concerning the rise of a subset of companies.

34

Which choice best supports the conclusion that in certain industries, companies have little chance of succeeding if they cannot obtain the market control held by superstar companies?

A) Lines 5-8 ("There . . . companies")

B) Lines 14-19 ("According . . . finance")

C) Lines 28-30 ("In other . . . bother")

D) Lines 73-77 ("But . . . economy")

CONTINUE

35

The passage most directly suggests that in recent years, companies that have been less successful than superstar companies have tended to

A) fail to capitalize on emerging technologies that may provide a competitive economic advantage.

B) neglect to hire the most skilled professionals in their industries.

C) focus on developing groundbreaking technologies that may benefit only their respective markets.

D) vie with a smaller pool of competitors for market share.

36

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

A) Lines 1-5 ("Our . . . Uber")

B) Lines 9-13 ("They . . . all")

C) Lines 24-26 ("These . . . change")

D) Lines 49-52 ("The fact . . . income")

37

As used in line 12, "conditions" most nearly means

A) restrictions.

B) circumstances.

C) demands.

D) qualifications.

38

As used in line 32, "deeply" most nearly means

A) broadly.

B) thoughtfully.

C) obscurely.

D) profoundly.

39

In context, the last two paragraphs (lines 53-77) serve mainly to

A) examine why technological advances outpace economic growth.

B) demonstrate how workforce requirements affect employment rates.

C) illustrate why company productivity increases yearly earnings.

D) clarify how efficient planning leads to new market possibilities.

40

Which claim about the manufacturing and business services sectors is best supported by the figures?

A) By 2004, the average percent change in total factor productivity for frontier firms in business services was greater than that for frontier firms in manufacturing.

B) By 2013, the total factor productivity for nonfrontier firms in both business services and manufacturing reflected growth resulting from expansion into new areas of commerce.

C) The average percent change in total factor productivity for nonfrontier firms in business services increased overall from 2001 to 2013, while that for nonfrontier firms in manufacturing decreased overall during that period.

D) Fluctuations in the average percent change in total factor productivity for frontier firms in business services from 2001 to 2013 were consistent with those for frontier firms in manufacturing during that period.

CONTINUE

41

Taken together, the figures best support which conclusion about total factor productivity from 2001 to 2013?

A) Nonfrontier firms in the business services sector were more profitable during this period than nonfrontier firms in the manufacturing sector due to their productivity.

B) Productivity increases in the business services sector in this period corresponded to productivity decreases in the manufacturing sector.

C) The disparity in productivity between frontier and nonfrontier firms in the manufacturing sector and in the business services sector generally increased over this period.

D) The manufacturing sector was more productive because it tended to adapt more readily to technological advances in this period than the business services sector did.

42

According to figure 1, in approximately which year was the average percent change in total factor productivity since 2001 greatest for frontier firms?

A) 2003

B) 2007

C) 2010

D) 2013

Questions 43-52 are based on the following passages.

Passage 1 is adapted from Morten E. Allentoft, "Recovering Samples for Ancient DNA Research—Guidelines for the Field Archaeologist." ©2013 by Antiquity Publications Ltd. Passage 2 is adapted from Sam Kean, "Ancient DNA." ©2015 by Chemical Heritage Foundation.

Passage 1

Working with ancient and degraded DNA is not without challenges. Most serious perhaps is the risk of contamination with contemporary DNA, which
Line can easily "swamp" the small amount of authentic
5 DNA in an ancient sample. This fact became painfully clear in the earlier years of ancient DNA research, when a number of high profile publications seemingly presented evidence of DNA from samples of extreme age—including 80-million-year-old
10 dinosaur bones and greater than 120-million-year-old insects. We are now aware that these results reflected modern contaminants, in part because the rate of *post mortem* fragmentation of DNA excludes the existence of DNA that old. In response to these
15 claims, a set of ancient DNA "rules" was established to minimise the risk of contamination and to provide some means for downstream authentication of the results and, since then, numerous studies have identified and assessed contamination problems in
20 ancient samples.

In essence, however, most of these rules represent "symptomatic treatment." If a sample is contaminated with modern DNA before entering the laboratory, for example during excavation, it can be
25 difficult to remove the contamination, and it can be impossible to distinguish between authentic ancient DNA and contaminants. This latter problem is particularly pertinent if the target DNA and the contaminant DNA are from the same species, as is
30 often the case when research is conducted on ancient human material.

In the era of high-throughput sequencing, statistical tools based on DNA damage signatures are now available to assess the overall authenticity of
35 "bulk" ancient DNA data. Considerable time and resources, however, are expended before the contamination can be identified, and if a sample has been contaminated decades or centuries ago it may result in contaminant DNA that displays degradation
40 damage patterns similar to that of true ancient DNA. Although strict laboratory exercises are often

CONTINUE

combined with bioinformatic analyses to respectively remove and identify DNA contamination, it would be extremely beneficial if the risk of contamination could be lowered in the first place.

Passage 2

Studying ancient DNA (aDNA) is a lot like playing Whac-A-Mole: stamp out one problem and another will pop up and take its place. Contamination, corruption, chromosomal shredding—it's a miracle scientists can even find aDNA in specimens, much less glean information from it. But a few recent breakthroughs have greatly expanded our ability to read aDNA and have already opened whole new vistas of evolution.

DNA disappears after cells die for a few reasons. All healthy cells have enzymes that shred DNA to recycle it, and unfortunately those enzymes keep right on shredding after death. Water and oxygen in the environment also react with DNA's backbone and degrade it further. I'd say these processes reduce DNA to confetti, but that doesn't do justice to just how thorough the destruction is. It's more like confetti making its own even tinier confetti, which in turn makes its own confetti. After a few thousand years a multibillion-base-pair genome might be reduced to scraps a few dozen letters long—a 100-million-fold reduction.

The best aDNA comes from samples unearthed in tundras or caves. Recent advances in computing power have also allowed scientists to assemble sequences from even minute scraps of DNA. The oldest recovered genome so far came from a horse's leg bone buried in Canada's Yukon Territory for 700,000 years; with the right sample and ever-better software to analyze it, scientists think they can push that back to one million years.

Finding the right sample solves only one problem, though. In most ancient tissues 99% of the DNA present comes from contamination by invading fungi and bacteria. So scientists have to deploy chemical snares, like "RNA bait." If searching for human DNA, researchers would prepare the bait by manufacturing millions of strips of human RNA (DNA's chemical cousin), albeit with one modification: these RNA strips have chemical Velcro attached to one end. When mixed into a sample, this RNA gloms onto the human DNA and only the human DNA. Scientists then pour in tiny metallic beads that—here's the key—also have chemical Velcro attached, locking the beads and the RNA/DNA strips together. Finally, a magnet holds onto the beads as the un-Velcroed microbial DNA washes away, leaving behind pristine samples. While this technique is expensive—developing the RNA bait can cost $300,000—new methods promise to drop that price to roughly $50.

43

In Passage 1, the main purpose of the second paragraph (lines 21-31) is to

A) explain in greater detail the nature of newly established procedures mentioned in the preceding paragraph.

B) assert that a solution presented in the preceding paragraph is inadequate for addressing the full scope of a problem.

C) emphasize the necessity of using different research technologies depending on the species to which the ancient DNA belongs.

D) describe the different kinds of contaminants that researchers working with ancient DNA have discovered through recent studies.

44

It can reasonably be inferred that the attitude of the author of Passage 1 toward the technology that has now become available for identifying and removing DNA contaminants is

A) somewhat cautious, because the technology remains costly to use but does not guarantee accurate assessment of DNA.

B) clearly dismissive, because the technology is narrowly limited in the types of DNA samples it can analyze.

C) genuinely hopeful, because the technology resolves ongoing challenges but does not interfere with the study of DNA.

D) openly appreciative, because the technology makes the work of analyzing ancient DNA considerably more straightforward.

CONTINUE

45

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

A) Lines 5-11 ("This . . . insects")
B) Lines 11-14 ("We are . . . old")
C) Lines 32-35 ("In the . . . data")
D) Lines 35-40 ("Considerable . . . DNA")

46

As used in line 41, "strict" most nearly means

A) absolute.
B) grim.
C) narrow.
D) rigorous.

47

It can most reasonably be inferred from Passage 2 that DNA shredded by enzymes is

A) most beneficial to scientists when the degree of shredding is high.
B) protected from further destruction after cells die.
C) used as material to support living functions in healthy cells.
D) preserved by water and oxygen in healthy cells.

48

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

A) Lines 56-58 ("All . . . death")
B) Lines 58-60 ("Water . . . further")
C) Lines 60-62 ("I'd say . . . destruction is")
D) Lines 64-67 ("After . . . reduction")

49

When the author of Passage 2 says that "scientists think they can push that back" (lines 75-76), he most likely means that scientists believe that a

A) certain limitation might become more pronounced.
B) particular boundary might be extended.
C) scientific theory might be refuted.
D) chronological sequence might be restructured.

50

Regarding scientific research involving aDNA, both passages imply that

A) even the smallest quantities of recovered aDNA contain traces of contamination.
B) the analysis of aDNA has led to a greater understanding of RNA.
C) evaluating traces of aDNA is generally problematic.
D) the usefulness of aDNA analysis is somewhat exaggerated.

CONTINUE

51

Given the discussion of the RNA bait technique in the last paragraph of Passage 2, would applying that technique be useful in the circumstances considered in Passage 1, lines 27-31 ("This latter . . . material")?

A) No, because the RNA bait technique is used to isolate DNA of one species from contaminant DNA of other species.

B) No, because the RNA bait technique can only be used on samples found in tundras or caves.

C) Yes, because the RNA bait technique can reveal the age of multiple types of DNA relatively precisely.

D) Yes, because the RNA bait technique provides an effective means of differentiating between genuine aDNA and contaminant DNA.

52

Which choice best states the relationship between the two passages?

A) Both passages consider a proposed approach for solving a problem, but Passage 2 argues more forcefully against implementing that approach.

B) Both passages examine the difficulties in a line of research, but Passage 2 gives more detail about how scientists are addressing those difficulties.

C) Both passages present hypotheses that are untested, but Passage 2 provides more evidence in support of its hypothesis.

D) Both passages raise concerns about the validity of research findings, but Passage 2 more effectively articulates the logic underlying the concerns it expresses.

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 1-11 are based on the following passage and supplementary material.

Shedding Light on Glowing Coral

Some corals are fluorescent, 1 this means that they absorb one color of light and emit a different one. Scientists have learned that shallow-water corals fluoresce as part of a symbiotic, or mutually beneficial, relationship with algae living inside 2 it. By absorbing potentially harmful ultraviolet light and emitting safer pink or

1

A) NO CHANGE
B) which it means
C) and meaning
D) meaning

2

A) NO CHANGE
B) them.
C) one.
D) that.

CONTINUE

purple light, fluorescent corals effectively provide a sun block for the 3 algae. The algae produce oxygen and other products that the corals need through photosynthesis. However, this finding does not explain why corals in deeper 4 water; where sunlight is less intense, also fluoresce.

Hoping to shed light on this mystery, a team of marine biologists from England and Israel began studying the chlorophyll (light-absorbing pigments involved in photosynthesis) within symbiotic algae. They exposed a sample of coral to different colors of light, finding that blue light—the most 5 lavish color of light in deep water—only reached chlorophyll close to the surface of the coral. However, red-orange light—the color emitted by deepwater corals—penetrated farther into the coral tissue, reaching more of the chlorophyll inside. The team therefore 6 hypothesized: that deepwater corals' conversion of blue light into red-orange light maximizes photosynthesis in the symbiotic algae, contributing to better overall coral survival.

3

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

A) algae, which, through photosynthesis, produce oxygen and other products that the corals need.

B) algae; happening through photosynthesis, the algae's production of oxygen and other products is needed by the corals.

C) algae, and the corals need oxygen and other products produced by the algae; this happens through photosynthesis.

D) algae, with the production of oxygen and other products that the corals need coming from the algae's photosynthesis.

4

A) NO CHANGE

B) water—

C) water,

D) water

5

A) NO CHANGE

B) generous

C) abundant

D) overflowing

6

A) NO CHANGE

B) hypothesized that,

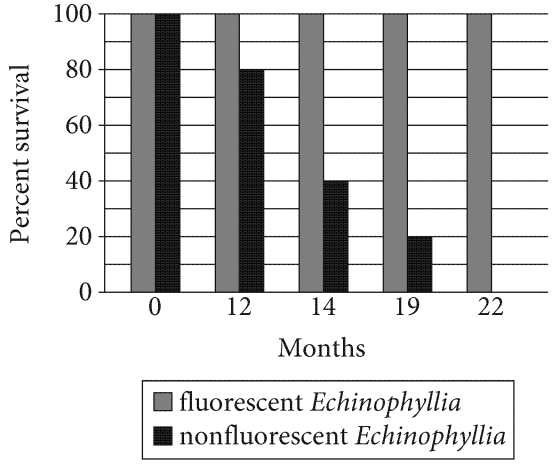
C) hypothesized that—

D) hypothesized that

CONTINUE

[1] To test this hypothesis, the research team conducted a two-year experiment that compared the survival of fluorescent and nonfluorescent specimens from the genus *Echinophyllia* under conditions that simulated deepwater light. [2] After 12 months, the fluorescent *Echinophyllia* were 7 deteriorating, but only about 80 percent of the nonfluorescent *Echinophyllia* survived. [3] Around the 19-month mark, the nonfluorescent *Echinophyllia* had dwindled to about 8 30 percent of their original amount. [4] By 22 months, the nonfluorescent *Echinophyllia* had died off completely, while 100 percent of the fluorescent *Echinophyllia* still lived. [5] These results suggest that the red-orange glow of deepwater corals might indeed be a symbiotic survival mechanism, just like 9 those of corals in shallow waters. 10

Long-Term Survival of Fluorescent and Nonfluorescent *Echinophyllia* under Simulated Deepwater Conditions



Adapted from Edward G. Smith et al., "Acclimatization of Symbiotic Corals to Mesophotic Light Environments through Wavelength Transformation by Fluorescent Protein Pigments." ©2017 by Edward G. Smith et al.

7

Which choice provides an accurate interpretation of the data in the graph?

A) NO CHANGE
B) thriving,
C) higher in number than they were at the start of the study,
D) at the lowest percent in the study,

8

Which choice offers accurate information from the graph?

A) NO CHANGE
B) 10 percent
C) 20 percent
D) 40 percent

9

A) NO CHANGE
B) the results of
C) the sun-blocking glow of
D) DELETE the underlined portion.

10

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

> They began by placing *Echinophyllia* that expressed a red-fluorescent protein and nonfluorescent *Echinophyllia* into an aquarium that was exposed to blue light.

The best placement for the sentence is

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

CONTINUE

The researchers hope that their findings can be used to improve coral conservation plans. 11 For example, some plans propose moving threatened shallow-water corals to deep waters, but this study suggests that without the right fluorescent pigments, those corals might not survive relocation. Therefore, as team member Jörg Wiedenmann points out, "it is of [the] utmost importance [that] we do our best to keep their homes in shallow water habitable."

11

A) NO CHANGE
B) Conversely,
C) Meanwhile,
D) As a result,

CONTINUE

Questions 12-22 are based on the following passage.

Thinking Small and Going Green

In today's marketplace, there is a growing 12 demand for: environmentally friendly business practices. According to a 2009 survey by the Boston Consulting Group, 73 percent of consumers think it is important for companies to have good environmental records. 13 Though there is limited evidence that greening initiatives increase employee morale, small businesses also stand to gain by going green: a 2014 University of Arkansas study found that the benefits of environmental initiatives were actually higher for small businesses 14 than for Fortune 500 companies. Measures to reduce resource consumption can help small businesses both directly, by lowering costs and raising revenues, and indirectly, by attracting new customers and even employees.

12

A) NO CHANGE
B) demand, for
C) demand; for
D) demand for

13

At this point, the writer wants to present an argument that will be refuted in the next part of the sentence. Which choice best accomplishes this goal?

A) NO CHANGE
B) Despite the incentives offered by the federal government for the use of renewable energy,
C) While some claim that only large corporations can afford to invest in eco-minded initiatives,
D) As companies and individuals become increasingly concerned about dwindling natural resources,

14

A) NO CHANGE
B) than the initiatives of
C) compared to the benefits of
D) than

CONTINUE

15 Founded in 1976, AJ's Auto Repair is a shop that has succeeded in improving its bottom line through an eco-friendly approach. By burning used oil for heat instead of 16 chucking it out, the company saves up to $10,000 per year. Indeed, AJ's 17 has saved a total of more than $200,000 over a ten-year period from its greening efforts. Moreover, the AJ's example shows that companies can actually make money while generating less waste. AJ's recently participated in a program that provided environmentally safe trunk light switches to customers. The first ninety people who came in for a free switch replacement ended up spending over $26,000 in other repairs.

15

Which choice provides the most effective transition from the previous paragraph?

A) NO CHANGE
B) Servicing motor homes as well as cars, AJ's Auto Repair
C) With a staff of about fifteen people, AJ's Auto Repair
D) One such business, AJ's Auto Repair in Salem, Oregon,

16

Which choice best maintains the tone and style of the passage?

A) NO CHANGE
B) junking it,
C) disposing of it,
D) tossing it out,

17

A) NO CHANGE
B) has saved
C) savings have exceeded
D) total savings have been

CONTINUE

Another small business that has made sustainability profitable is Transcendentist, a dental practice in Berkeley, California. While most dental offices rely on wasteful disposable products, **18** Transcendentist, however, introduced a line of reusable supplies, including cotton cloth headrests. Not only does Transcendentist save money by cutting spending on disposable products, it also profits by selling its reusable products to dentists across the country.

Green initiatives also strengthen a company's image, **19** which can yield tangible benefits. The founder of AJ's, Bob **20** Anderson estimates, that the company's

18

A) NO CHANGE
B) but Transcendentist
C) whereas Transcendentist
D) Transcendentist

19

Which choice results in the most effective transition to the next sentence?

A) NO CHANGE
B) rewarding the company's loyal customers.
C) although image isn't everything.
D) a key component in attracting new employees.

20

A) NO CHANGE
B) Anderson, estimates
C) Anderson, estimates:
D) Anderson estimates

CONTINUE

green reputation has increased its customer base by at least 18 percent. 21 Anderson ensures that the company stays in compliance with government regulations. Companies with eco-friendly practices appeal not only to environmentally conscious clientele but also to 22 perspective employees: according to a recent MonsterTRAK poll, 92 percent of young professionals desire to work at companies perceived as environmentally mindful. In an economy where companies can no longer afford to ignore their environmental footprints, cutting down on resource use is a feasible, and ultimately profitable, step.

21

Which choice provides a second example that is most similar to the one in the previous sentence?

A) NO CHANGE
B) In yet another example of their commitment to efficiency, Anderson and his team incorporated oil tanks into workbenches to save space.
C) Some local chambers of commerce offer free greening assistance to small-business owners.
D) Transcendentist attracts up to forty new clients per month, thanks in part to media attention for its green initiatives.

22

A) NO CHANGE
B) respective
C) prospective
D) receptive

CONTINUE

Questions 23-33 are based on the following passage.

Storied Architecture

A survey of the buildings designed by Ghanaian British architect David Adjaye reveals no obvious signature style. His Moscow School of Management Skolkovo in Russia features a two-story, 150-meter-wide circular base, on top of which 23 is placed four differently sized rectangular prisms tiled in uneven herringbone patterns of transparent and colored glass panels. Perhaps more accurately described as a complex of buildings than as a single building, the structure looks as though someone has balanced giant mismatched blocks on top of a disk. Another of Adjaye's projects, the Francis A. Gregory Neighborhood Library in Washington, DC, features exterior walls that 24 resemble: a tilted checkerboard, alternating clear and opaque squares create a geometric diamond pattern. And in Doha, Qatar, a nondescript residence blends in with surrounding monochrome beige stone structures. Each of these designs is distinctive in that no particular texture, material, shape, or pattern identifies the building as one of Adjaye's.

23

A) NO CHANGE
B) there is
C) are
D) is

24

A) NO CHANGE
B) resemble a tilted checkerboard,
C) resemble a tilted checkerboard
D) resemble a tilted checkerboard:

CONTINUE

25 Adjaye's architecture firm is staffed with professionals who represent a wide range of architectural perspectives. For each project, Adjaye 26 reviews extensive research about the locale where the building will be constructed. He 27 considers the local governing structure and issues of social justice. Various databases provide him with relevant geologic information. Adjaye also studies the history of the site and of the people who will be using the building. So central is this research to 28 Adjayes design process's that his architecture firm employs a team of social scientists.

25

Which choice most effectively establishes the main topic of the paragraph?

A) NO CHANGE
B) Some architecture experts have suggested there may be recurring trends—for example, the way Adjaye uses walls not only to divide but also to create spaces for public interaction.
C) Given that Adjaye will likely design more buildings over the course of his career, it's possible—even probable—that a signature style will still emerge.
D) What is common to Adjaye's buildings is something that can't be seen—a deeply research-focused design process.

26

A) NO CHANGE
B) reviews and examines lots of extensive
C) reviews a lot of extensive
D) examines and reviews

27

A) NO CHANGE
B) had considered
C) is considering
D) did consider

28

A) NO CHANGE
B) Adjaye's design process
C) Adjayes' design process
D) Adjayes design process

CONTINUE

This research process can inform Adjaye's designs in any number of ways. In the case of Adjaye's design for the Smithsonian National Museum of African American History and Culture, the research strongly influenced the shape of the building. While trying to better understand the story the museum would be telling, Adjaye had become fascinated with traditional sculptures made by Yoruba craftspeople of western Africa. 29 By contrast, one type of headwear that recurred in the figures 30 captured Adjaye's imagination. The structure of this headwear—three inverted pyramids nested one atop the other—became the shape of the museum. 31

29

A) NO CHANGE
B) For these reasons,
C) In particular,
D) Moreover,

30

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

A) captured Adjaye's imagination, and then the headwear's structure—
B) captured Adjaye's imagination as the structure of the headwear—
C) so captured Adjaye's imagination that its structure—
D) capturing Adjaye's imagination, the structure of it—

31

At this point, the writer wants to reinforce the main point being made in the paragraph with a quotation from Adjaye. Which of the following quotations from a lecture Adjaye gave in 2016 best accomplishes this goal?

A) "This museum," Adjaye says, "comes into being after . . . a two-hundred-year quest to have a museum for—to really talk about the contribution of the African American community to the identity of America."
B) Adjaye stated that he had wanted "to see if we could create a museum where the figure and the form of the museum spoke to the story from the silhouette—from the immediate perception of it."
C) According to Adjaye, "We started with the Yoruba in West Africa because, essentially, the Yoruba were the greatest craftsmen."
D) In describing the museum, Adjaye makes the distinction that "it's a narrative museum, so it's not about precious objects."

CONTINUE

Other architects, of course, conduct and rely on research when they design buildings, 32 but Adjaye's body of work has been defined by it. 33 Whether or not you like Adjaye's buildings, you have to admit that they're interesting to look at.

32

A) NO CHANGE
B) however,
C) nonetheless,
D) DELETE the underlined portion.

33

Which choice results in the most effective conclusion for the passage?

A) NO CHANGE
B) Because of this process, each building tells a unique story—if not about Adjaye's aesthetic style, then about the place in which, and the people for whom, it is built.
C) In his career thus far, Adjaye has provided us with many spectacular buildings—each of which has some very interesting features and puts on display his considerable talent as an architect.
D) Architecture firms that don't include a similar research-based approach would do well to consider implementing one.

CONTINUE

Questions 34-44 are based on the following passage.

A Voice from the Ancient Past

Though few people today have heard of her, a woman named Enheduanna is believed to be the world's earliest known writer. She held the 34 important political role of high priestess in Mesopotamia's first major empire (near present-day Iraq and Kuwait) in the twenty-third century BCE. Preserved in ancient artifacts, her writings include clear uses of rhetorical devices—strategies used to effectively communicate an idea or opinion to an audience. The discovery of these artifacts has led scholars to reevaluate the popular notion that 35 the gods and goddesses of the Mesopotamian empire were similar to those of the ancient Greeks.

Researchers suggest that Enheduanna's writings contain clear examples of establishing ethos, a rhetorical strategy through which authors persuade an audience of their credibility. 36 The importance of religion to the Mesopotamians is reflected in a calcite disk dated to around 2300 BCE, discovered in 1926 when a British archaeologist was excavating the temple of Ur. The disk's front contains an inscribed image that depicts Enheduanna overseeing a religious 37 procession, the back includes her written dedication of the artifact to Nanna, the god of the moon. By authoring the dedication (and through the disk's visual representation of her power), she announces her authority to those who might see the disk, and she asserts her devotion to Nanna.

34

A) NO CHANGE
B) significantly important political role
C) position of an important political role
D) significant political role and position

35

Which choice most effectively sets up the main idea of the passage?

A) NO CHANGE
B) the study of rhetoric's history should start with the ancient Greeks, who lived 2,000 years after Enheduanna.
C) the very earliest forms of writing were developed as a means to keep records of grain and cattle transactions.
D) Enheduanna was the daughter of Sargon of Akkad, a king who conquered and ruled over the Sumerian city-states.

36

Which choice provides the most effective transition from the previous sentence to the information that follows in the paragraph?

A) NO CHANGE
B) On display in the Penn Museum's Middle East Galleries is
C) The earliest example of such writing can be found in
D) An ancient political conflict probably led someone to break

37

A) NO CHANGE
B) procession; and,
C) procession;
D) procession

CONTINUE

[1] Enheduanna's many hymns also incorporate rhetorical devices. [2] One of her most famous is "The Exaltation of Inanna," which tells the story of a political uprising that temporarily ended Enheduanna's role as high priestess. [3] Later, she directly asks the goddess Inanna to **38** give her back her old job, referring to their personal relationship: "Might your heart not be appeased towards me? . . . great exalted lady, I have recited this song for you." [4] Scholars suggest that the use of first person again establishes ethos because she is identifying herself **39** to, gods and mortals alike, as the author of this "song." [5] When she describes her political exile, she writes, "I approached that shade, but I was covered with a storm." [6] In addition, as researcher Roberta Binkley points out, her appeal to the **40** sympathies of Inanna and her readers when describing her difficult situation **41** have shown pathos, the rhetorical strategy of persuasion using emotion. **42**

38

A) NO CHANGE
B) let her have some clout again,
C) revive her hegemony,
D) restore her to power,

39

A) NO CHANGE
B) to gods and mortals alike
C) to gods, and mortals alike
D) to gods and mortals alike,

40

A) NO CHANGE
B) sympathies' of Inanna and her readers
C) sympathies' of Inanna and her readers'
D) sympathies of Inanna and her reader's

41

A) NO CHANGE
B) show
C) shows
D) are showing

42

To make this paragraph most logical, sentence 5 should be placed

A) where it is now.
B) after sentence 2.
C) after sentence 3.
D) after sentence 6.

CONTINUE

Although writers throughout history 43 will be applying rhetorical techniques to express opinions, scholars typically associate the origins of devices such as ethos and pathos with ancient Greece, 44 especially since Greek philosopher Aristotle coined the terms. Today, analysis of Enheduanna's writing is influencing how scholars think about effective communication and adds to their understanding of how rhetoric emerged.

43

A) NO CHANGE
B) are applying
C) can apply
D) have applied

44

The writer is considering deleting the underlined portion, adjusting the punctuation as needed. Should the underlined portion be kept or deleted?

A) Kept, because it provides a connection to the information about the Mesopotamian empire given in the first paragraph.
B) Kept, because it explains why certain rhetorical devices are thought to have originated in ancient Greece.
C) Deleted, because it fails to explain how ancient Greeks used rhetorical devices.
D) Deleted, because it provides a detail about rhetorical devices that is unrelated to the paragraph's main focus.

STOP

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

No Test Material On This Page

Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

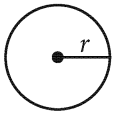
DIRECTIONS

For questions 1-15, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble 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.

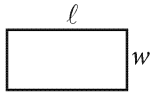
NOTES

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.

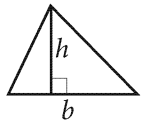
REFERENCE



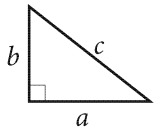
$A = \pi r^2$
$C = 2\pi r$



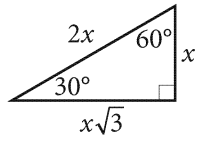
$A = \ell w$

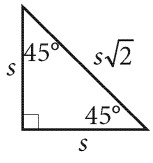


$A = \frac{1}{2}bh$

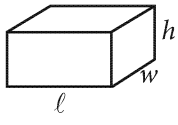


$c^2 = a^2 + b^2$

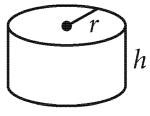




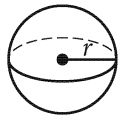
Special Right Triangles



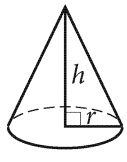
$V = \ell wh$



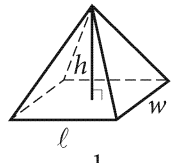
$V = \pi r^2 h$



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



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

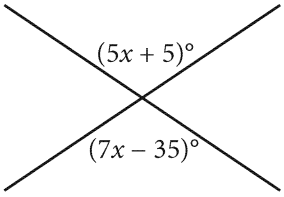


$V = \frac{1}{3}\ell wh$

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.

CONTINUE

1



Two lines intersect as shown. What is the value of x ?

A) 15
B) 20
C) 25
D) 30

2

$$|\,2x - 4\,| = 8$$

What is the positive solution to the given equation?

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

3

Which of the following is equivalent to $4x^3 + 8x^2$?

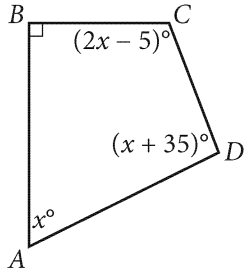
A) $12x^5$
B) $12x^2(2x + 1)$
C) $4x^2(x + 2)$
D) $x^2(12 + x)$

4

If $2n + 12 = 26n$, what is the value of $6n$?

A) 8
B) 4
C) 3
D) $\frac{1}{2}$

5



Quadrilateral $ABCD$ is shown. Which equation shows how the measures of the angles of the quadrilateral are related?

A) $x + 90 + (2x - 5) + (x + 35) = 360$
B) $4(x + 90 + (2x - 5) + (x + 35)) = 360$
C) $x + (2x - 5) + (x + 35) = 360$
D) $4(x + (2x - 5) + (x + 35)) = 360$

CONTINUE

6

In right triangle ABC, the length of side $\overline{AC}$ is 12, the measure of $\angle A$ is 40°, and $\angle B$ is a right angle. Which of the following can be determined using the information given?

I. The measure of $\angle C$

II. The length of side $\overline{AB}$

A) I only
B) II only
C) I and II
D) Neither I nor II

7

In the xy-plane, line ℓ has a slope of 2. Line k is perpendicular to line ℓ and contains the point $(4, 2)$. Which of the following is an equation of line k ?

A) $y = -2x - 6$

B) $y = -2x + 10$

C) $y = -\frac{1}{2}x$

D) $y = -\frac{1}{2}x + 4$

8

$$c = \frac{x}{y}$$

The given equation relates the variables c, x, and y, where $c > 0$, $x > 0$, and $y > 0$. Which equation correctly expresses y in terms of c and x ?

A) $y = cx$

B) $y = \frac{1}{cx}$

C) $y = \frac{c}{x}$

D) $y = \frac{x}{c}$

9

The function f is a linear function. The y-intercept of the graph of $y = f(x)$ in the xy-plane is $(0, -12)$. What is the y-intercept of the graph of $y = f(x) + 2$?

A) $(0, -14)$
B) $(0, -10)$
C) $(-2, -12)$
D) $(2, -12)$

CONTINUE

10

Which of the following is(are) an x-intercept of the graph of $y = \dfrac{(x + 3)(x - 2)}{x}$ in the xy-plane?

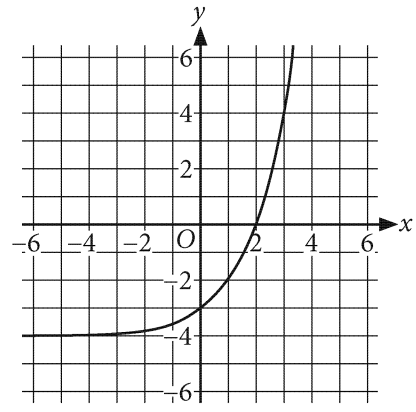
I. $(-3, 0)$

II. $(2, 0)$

III. $(0, 0)$

A) I only
B) III only
C) I and II only
D) I, II and III

11

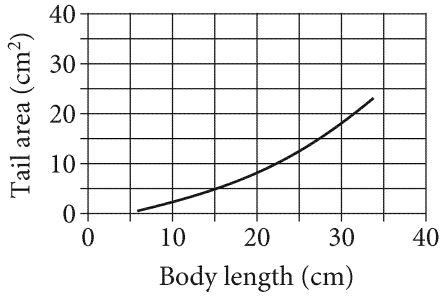


The graph of $y = 2^x - a$ is shown, where a is a constant. What is the value of a ?

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

CONTINUE

12



For a certain group of fish, the graph models the relationship between body length L, in centimeters (cm), and tail area A, in square centimeters (cm^2), where $6 \leq L \leq 34$. Which equation represents the relationship between body length and tail area?

A) $A = 0.02L^2$

B) $A = 1.23L^2$

C) $A = 2.02L^2$

D) $A = 3.23L^2$

13

$$8x - 4y = 7$$
$$3x + 6y = 12$$

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

A) 1.5

B) 1.25

C) 0.5

D) 0.25

14

$$y = 2x + 5$$
$$y = kx + 3$$

In the given system of equations, k is a constant. The system has exactly one solution. Which of the following could be the value of k ?

I. 2

II. 5

A) I only

B) II only

C) I and II

D) Neither I nor II

15

$$b(t) = 100(1.11)^t$$

The given function b models the number of flour beetles in a certain area, where t represents the number of days after June 1. Which of the following is the best interpretation of the number 1.11 in this context?

A) The model predicts that there were approximately 1.11 flour beetles in this area on June 1.

B) The model predicts that the number of flour beetles in this area increases by approximately 1.11 each day.

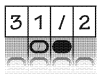
C) The model predicts that it will take approximately 1.11 days for the number of flour beetles to double.

D) The model predicts that the number of flour beetles grows by a factor of approximately 1.11 each day.

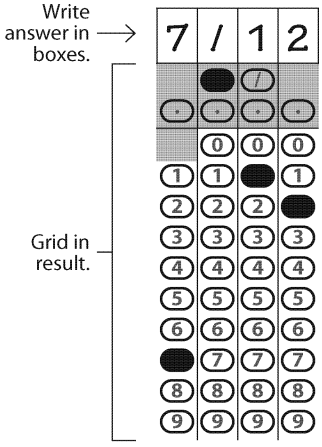
CONTINUE

DIRECTIONS

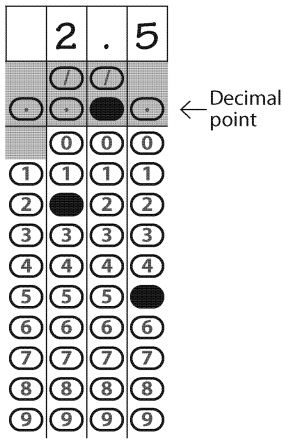
For questions 16-20, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

1. 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 bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **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.

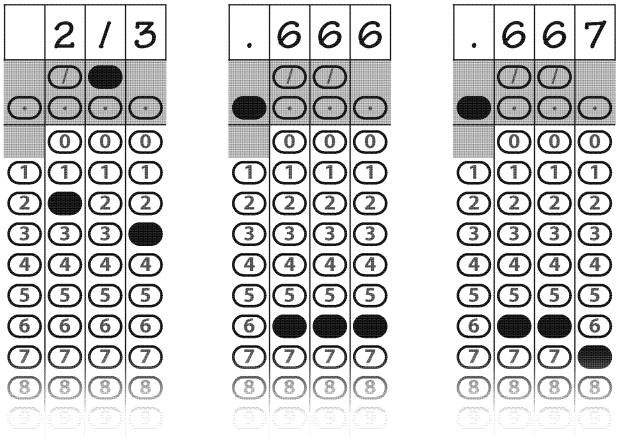
Answer: $\frac{7}{12}$ are:



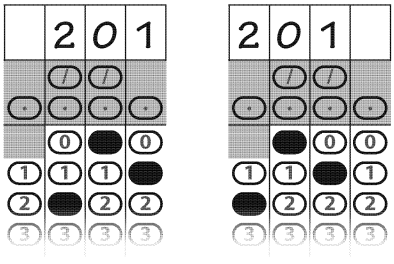
Answer: 2.5



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



Answer: 201 – either position is correct



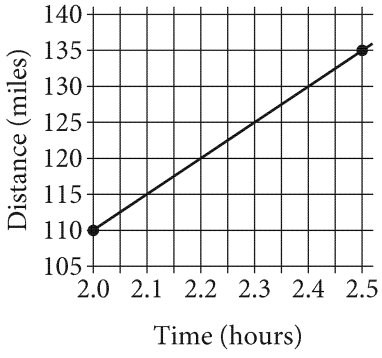
NOTE:
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

CONTINUE

16

In the xy-plane, the graph of $y = \frac{1}{2}x + b$, where b is a constant, intersects the x-axis at $(-6, 0)$. What is the value of b ?

17



For part of a trip, a car traveled directly away from its starting point at a constant speed. The graph shows the car's distance from its starting point, in miles, for times from 2.0 hours to 2.5 hours after the start of the trip. What was the speed of the car, in miles per hour, during this part of the trip?

18

$$x^2 - 8x + y^2 - 10y = 40$$

In the xy-plane, the graph of the given equation is a circle. What is the radius of this circle?

19

$$x^2 - 6x + 7 = 0$$

What is the sum of the solutions to the equation above?

20

$$\left(\sqrt{x^3}\right)^a, \text{ where } x \geq 0$$

In the given expression, a is a constant. The expression is equivalent to x^6, where $x \geq 0$. What is the value of a ?

STOP

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

No Test Material On This Page

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

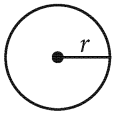
DIRECTIONS

For questions 1-30, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble 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 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

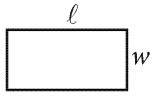
NOTES

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.

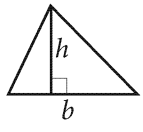
REFERENCE



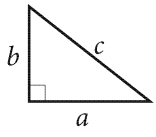
$A = \pi r^2$
$C = 2\pi r$



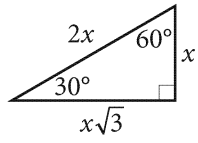
$A = \ell w$

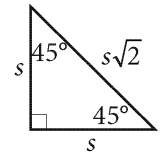


$A = \frac{1}{2}bh$

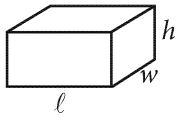


$c^2 = a^2 + b^2$

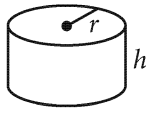




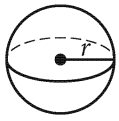
Special Right Triangles



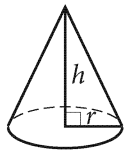
$V = \ell wh$



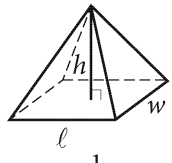
$V = \pi r^2 h$



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



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



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

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.

CONTINUE

1

It takes 6 hours to travel m miles. At this rate, how much time, in hours, will it take to travel $5m$ miles?

A) 30

B) 24

C) 15

D) 12

2

If $2x + 4 = 100$, what is the value of $6x + 12$?

A) 400

B) 300

C) 288

D) 48

3

A length of 8 furlongs is equivalent to how many meters? (Use 1 furlong = 201 meters.)

A) 25

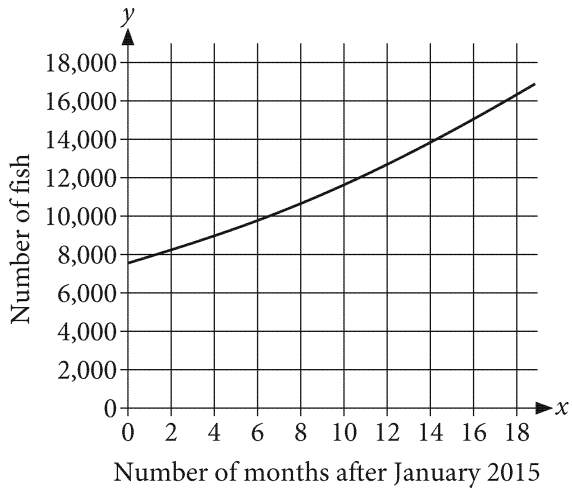
B) 40

C) 209

D) 1,608

4

The curve models the number of fish in a certain population.



Which of the following is closest to the number of fish in the population 16 months after January 2015?

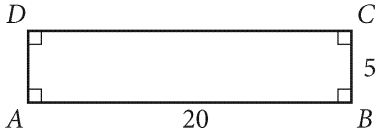
A) 8,000

B) 10,000

C) 15,000

D) 18,000

5



What is the ratio of AB to BC ?

A) 25 to 1

B) 20 to 5

C) 20 to 4

D) 5 to 4

CONTINUE

6

Each of the whole numbers from 1 to 20 is written on one of 20 identical pieces of paper. The pieces of paper are then put into a hat and mixed together. If a piece of paper is selected at random from the hat, what is the probability that the number on it is a multiple of 3 ?

A) $\frac{1}{20}$

B) $\frac{3}{20}$

C) $\frac{6}{20}$

D) $\frac{1}{3}$

7

The table shows the maximum depth, in meters, of the 5 deepest oceanic trenches.

Trench name	Depth (meters)
Kermadec	10,047
Kuril-Kamchatka	10,500
Mariana	11,033
Philippine	10,540
Tonga	10,882

What is the range, in meters, of these 5 trench depths?

A) 151

B) 533

C) 835

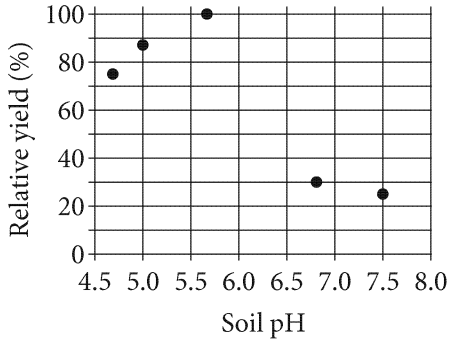
D) 986

CONTINUE

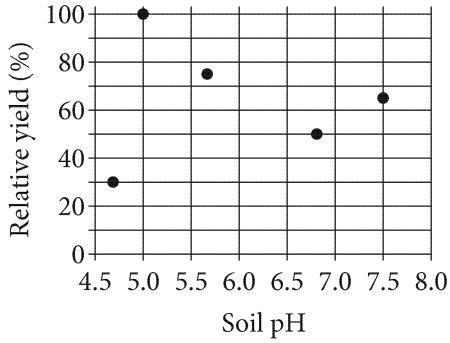
8

The relative yield of corn, expressed as a percent, and soil pH were recorded for 5 samples. For the 5 samples, the relative yield of corn reached a maximum when the soil had a pH of 6.8, and then decreased as the soil pH increased. Which scatterplot could represent these data?

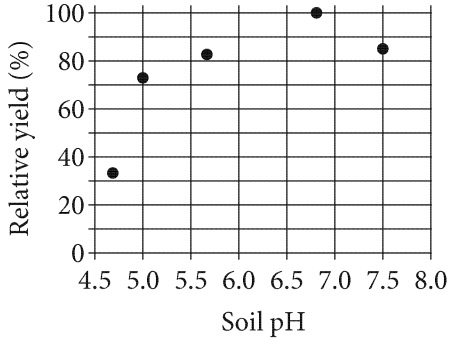
A)



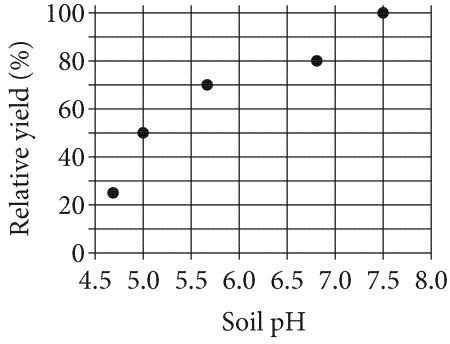
B)



C)



D)



9

After a new car is purchased, the value of the car is modeled by a function that decreases exponentially over time. Which of the following could describe how the value of the car changes each year?

A) Each year, the value of the car is \$800 more than the previous year.

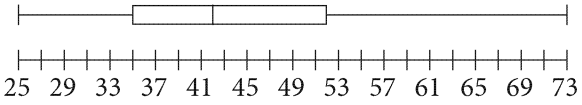
B) Each year, the value of the car is \$800 less than the previous year.

C) Each year, the value of the car is 8% more than the previous year.

D) Each year, the value of the car is 8% less than the previous year.

CONTINUE

10



The daily high temperatures, in degrees Fahrenheit, for a city in the month of February in 2017 are summarized in the box plot shown. Which of the following is closest to the median of the high temperatures, in degrees Fahrenheit, of the city in February 2017?

A) 35
B) 42
C) 48
D) 51

11

$$2a + b = 17$$
$$a + 2b = 19$$

The solution to the given system of equations is (a, b). What is the value of $3a + 3b$?

A) 2
B) 6
C) 22
D) 36

12

In triangle ABC, the measure of angle C is 90°. If $\sin A = \frac{3}{5}$, what is $\cos B$?

A) $\frac{3}{5}$
B) $\frac{4}{5}$
C) $\frac{5}{4}$
D) $\frac{5}{3}$

13

For the linear function f, the graph of $y = f(x)$ in the xy-plane passes through the points $(0, 2)$ and $(2, 6)$. Which equation defines f ?

A) $y = \frac{1}{2}x + 2$
B) $y = \frac{2}{3}x + 2$
C) $y = 2x + 2$
D) $y = 3x + 2$

CONTINUE

14

The 2017 Wyoming state senate had 30 elected members consisting of Democrats and Republicans. Let d represent the number of Democrats who vote yes for a bill, and let r represent the number of Republicans who vote yes for a bill. For a bill to pass, more than half of the 30 senators must vote yes. Which of the following inequalities represents all possible values of d and r for a bill to pass?

A) $d + r > 15$

B) $d + r < 15$

C) $d + r \geq 15$

D) $d + r \leq 15$

15

$$x^2 - 2x + c = 0$$

In the given equation, c is a constant. If the equation has exactly one solution, what is the value of c ?

A) -2

B) 0

C) 1

D) 2

16

Length (miles)	Cost (millions of dollars)
5	405
10	810
15	1,215

The table gives some values of possible lengths x, in miles, of a monorail system, and their corresponding costs to build $f(x)$, in millions of dollars. Which of the following equations models this relationship?

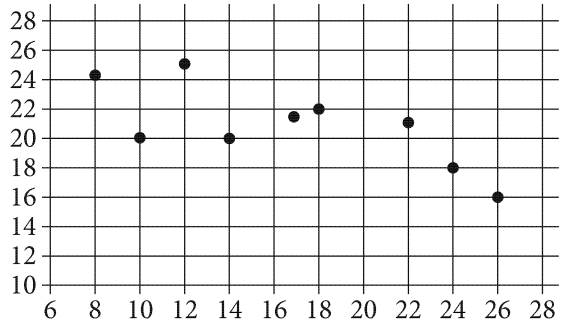
A) $f(x) = 81x$

B) $f(x) = 405x$

C) $f(x) = 5x + 405$

D) $f(x) = 405x + 5$

17



A set of data is represented by the scatterplot in the portion of the xy-plane shown. Which of the following linear equations best models the data?

A) $y = 26.2 - 0.32x$

B) $y = 18.2 + 0.28x$

C) $y = 25.4 - 6x$

D) $y = 18.2 - 6x$

CONTINUE

Questions 18 and 19 refer to the following information.

	Hardcover	Paperback
Revenue	$24	$18
Cost	$14	$10

A certain book is available from a publishing company in both hardcover and paperback. The table shows the revenue and cost in 2016 for each of the hardcover and paperback books produced by the company.

18

In 2016 the total cost for 200 of the books that were sold was between $2,200 and $2,400. Which of the following could be the number of hardcover books that were sold?

A) 80

B) 120

C) 160

D) 200

19

An analyst estimates that the cost of each of the paperback books will increase $0.50 each year after 2016. Which of the following models the cost c, in dollars, of each of the paperback books t years after 2016?

A) $c = 0.5 + 10t$

B) $c = 0.5 + 18t$

C) $c = 10 + 0.5t$

D) $c = 18 + 0.5t$

20

Line m is defined by $y = -\frac{3}{4}x + 2$. Line p is parallel to line m in the xy-plane and passes through the point $(4, -3)$. Which equation defines line p ?

A) $y = -\frac{3}{4}x - 3$

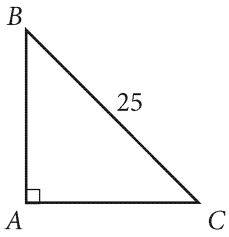
B) $y = -\frac{3}{4}x$

C) $y = -\frac{3}{4}x + 1$

D) $y = -\frac{3}{4}x + 4$

CONTINUE

21



Which of the following additional measurements to the triangle provides enough information to determine the length of $\overline{AB}$?

I. The length of $\overline{AC}$

II. The measure of $\angle ABC$

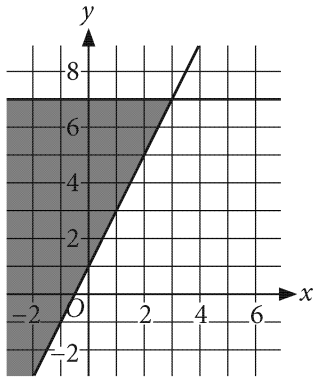
A) I only

B) II only

C) Either I or II

D) Neither I nor II

22



The solution to which system of inequalities is represented by the shaded region of the graph?

A) $y \leq 7$
$y \leq 2x + 1$

B) $y \leq 7$
$y \geq 2x + 1$

C) $x \leq 7$
$2y \leq x$

D) $x \leq 7$
$2y \geq x$

CONTINUE

23

Number of pages	Frequency
46	1
47	2
48	4
49	5
50	5
51	2
52	5
53	4

Paulina has 28 books in her collection. The frequency table summarizes the number of pages in each book. If she buys a new book that has 62 pages, how will this impact the mean and median numbers of pages of the books in her collection?

A) The mean and median will both increase.

B) The mean and median will both decrease.

C) The mean will increase, and the median will remain the same.

D) The mean will decrease, and the median will remain the same.

24

A recipe requires f cups of flour. Arnold accidentally used 50% more flour than the recipe required. How much flour did Arnold use in terms of f ?

A) $50f$

B) $150f$

C) $0.5f$

D) $1.5f$

25

	Triangle	Rectangle
Blue	7	8
Red	5	6

The table shows the distribution of objects in a collection by shape and color. If a triangle is selected at random, what is the probability that the selected triangle is red?

A) $\frac{5}{26}$

B) $\frac{5}{12}$

C) $\frac{5}{11}$

D) $\frac{5}{7}$

CONTINUE

26

A group of students participated in a study. It was determined that for each hour of experience performing a certain task, the time necessary for each student to complete the task decreased by 5%. Wendy took 30 minutes to complete the task with no experience. Which function models the amount of time T, in minutes, it will take Wendy to complete the task after x hours of experience?

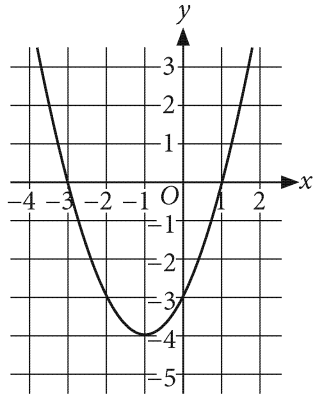
A) $T = 30(0.05)^x$

B) $T = 30(0.50)^x$

C) $T = 30(0.95)^x$

D) $T = 95(0.30)^x$

27



An equation for the graph shown is $y = (x - 1)(x + b)$, where b is a constant. What is the value of b ?

A) 3

B) 1

C) −3

D) −4

28

A school club is paid \$315 for recycling c pounds of aluminum cans and p tons of paper. The equation $0.50c + 60p = 315$ represents this situation. What is the interpretation of $60p$ in this context?

A) The total weight, in tons, of paper the club recycled

B) The total amount, in dollars, the club is paid for each ton of paper recycled

C) The total weight, in tons, of all the aluminum cans and paper the club recycled

D) The total amount, in dollars, the club is paid for p tons of paper recycled

CONTINUE

29

$$(x - 3)^2 = 81$$

What is the sum of the solutions to the given equation?

A) 0

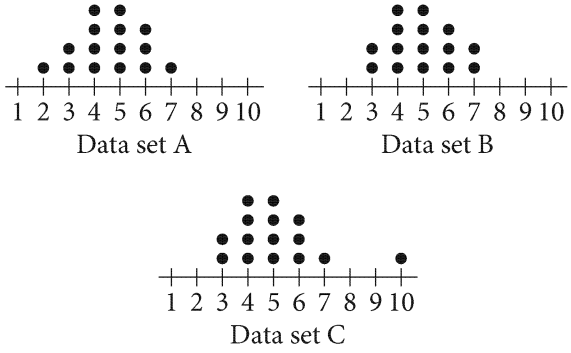
B) 6

C) 9

D) 12

30

Each of the three data sets represented by the three dot plots has 15 values.



The medians of data sets A, B, and C are a, b, and c, respectively. What is the relationship between a, b, and c ?

A) $a > b > c$

B) $b > a > c$

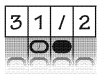
C) $c > b > a$

D) $a = b = c$

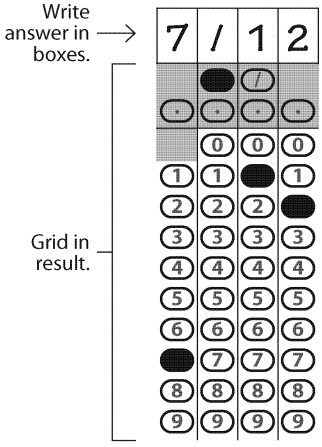
CONTINUE

DIRECTIONS

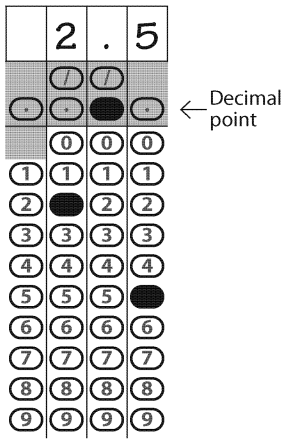
For questions 31-38, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

1. 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 bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **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.

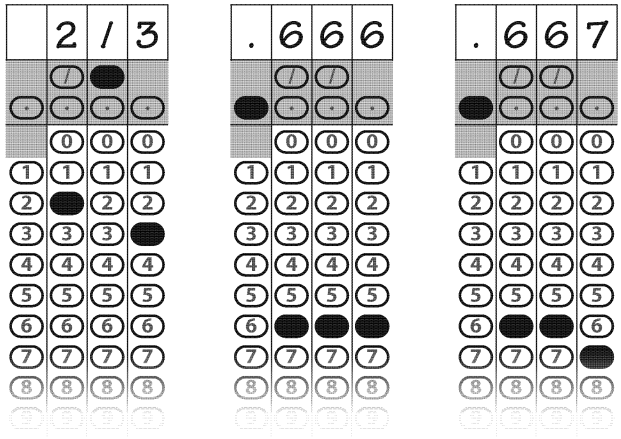
Answer: $\frac{7}{12}$ are:



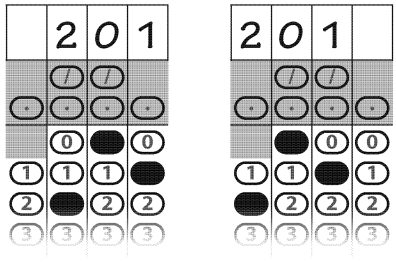
Answer: 2.5



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



Answer: 201 – either position is correct



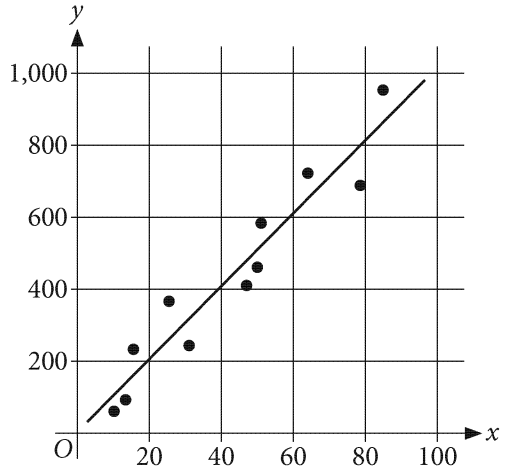
NOTE:
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

CONTINUE

31

The side length of square $ABCD$ is twice the side length of square $EFGH$. If the area of square $EFGH$ is 9, what is the area of square $ABCD$?

32



The scatterplot shows 11 data points, along with a line of best fit for the data. For how many of the data points does the line of best fit predict a y-value that is less than the actual y-value?

33

$$\frac{1}{4}x = cx + 2$$

In the given equation, c is a constant. The equation has no solution. What is the value of c ?

34

What number is 1% greater than 7000 ?

CONTINUE

Questions 35 and 36 refer to the following information.

Percentage of Components in a Liquid Mixture, by Volume

Component A	10.0%
Component B	25.0%
Component C	20.0%
Component D	45.0%

A liquid mixture is composed of four components, and the table shows the percentage, by volume, of each component. The volume of each component prior to mixing is the same as the volume of that component in the mixture. A procedure can be used to extract the individual components that were combined to form the liquid mixture. When the procedure is applied to extract the components in the mixture, a portion of the volume of the components may be lost.

35

If the volume of component B in the liquid mixture is 1.00 milliliter, what is the total volume, in milliliters, of the liquid mixture?

36

The procedure was applied to a new sample of 9.00 milliliters of the liquid mixture to extract component C. Due to the loss of volume from the procedure, the extracted volume of component C was only 90.0% of the original volume of this component. What was the extracted volume of component C, in milliliters?

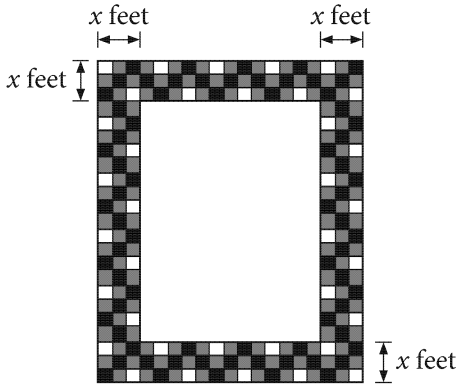
CONTINUE

37

$$f(x) = x^2 + bx$$
$$g(x) = 3x^2 - 9x$$

The functions f and g are defined above, where b is a constant. If $f(x) \cdot g(x) = 3x^4 - 8x^3 - 3x^2$, what is the value of b ?

38



Note: Figure not drawn to scale.

The rectangular mirror shown above has width 3 feet and length 5 feet and is surrounded by a mosaic border with a width of x feet. If the area of the mirror with the border is 35 square feet, what is the width x, in feet, of the border?

STOP

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

May 8, 2021 US (Official)

ANSWER KEY

Reading Test Answers

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

READING TEST RAW SCORE (NUMBER OF CORRECT ANSWERS)

Writing and Language Test Answers

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

WRITING AND LANGUAGE TEST RAW SCORE (NUMBER OF CORRECT ANSWERS)

Math Test – No Calculator Answers

1 B	11 A
2 C	12 A
3 C	13 A
4 C	14 B
5 A	15 D
6 C	16 3
7 D	17 50
8 D	18 9
9 B	19 6
10 C	20 4

MATH TEST – NO CALCULATOR RAW SCORE (NUMBER OF CORRECT ANSWERS)

Math Test – Calculator Answers

1 A	11 D	21 C	31 36
2 B	12 A	22 B	32 5
3 D	13 C	23 C	33 1/4, .25
4 C	14 A	24 D	34 7070
5 B	15 C	25 B	35 4
6 C	16 A	26 C	36 1.62
7 D	17 A	27 A	37 1/3, .333
8 C	18 A	28 D	38 1
9 D	19 C	29 B	
10 B	20 B	30 D	

MATH TEST – CALCULATOR RAW SCORE (NUMBER OF CORRECT ANSWERS)