

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.

The passage is adapted from Saki, "The Background," originally published in 1911.

"That woman's art-jargon tires me," said Clovis to his journalist friend. "She's so fond of talking of certain pictures as 'growing on one,' as though they were a sort of fungus."

Line 5 "That reminds me," said the journalist, "of the story of Henri Deplis. Have I ever told it to you?"

Clovis shook his head.

"Henri Deplis was by birth a native of the Grand Duchy of Luxemburg. On maturer reflection he
10 became a commercial traveller. His business activities frequently took him beyond the limits of the Grand Duchy, and he was stopping in a small town of Northern Italy when news reached him from home that a legacy from a distant and deceased relative had
15 fallen to his share.

"It was not a large legacy, even from the modest standpoint of Henri Deplis, but it impelled him towards some seemingly harmless extravagances. In particular it led him to patronize local art as
20 represented by the tattoo-needles of Signor Andreas Pincini. Signor Pincini was, perhaps, the most brilliant master of tattoo craft that Italy had ever known, but his circumstances were decidedly impoverished, and for the sum of six hundred francs he gladly undertook
25 to cover his client's back, from the collar-bone down to the waist-line, with a glowing representation of the Fall of Icarus. The design, when finally developed,

was a slight disappointment to Monsieur Deplis, who had suspected Icarus of being a fortress taken by
30 Wallenstein in the Thirty Years' War, but he was more than satisfied with the execution of the work, which was acclaimed by all who had the privilege of seeing it as Pincini's masterpiece.

"It was his greatest effort, and his last. Without even
35 waiting to be paid, the illustrious craftsman departed this life, and was buried under an ornate tombstone, whose winged cherubs would have afforded singularly little scope for the exercise of his favourite art. There remained, however, the widow Pincini, to whom the
40 six hundred francs were due. And thereupon arose the great crisis in the life of Henri Deplis, traveller of commerce. The legacy, under the stress of numerous little calls on its substance, had dwindled to very insignificant proportions, and when a pressing wine
45 bill and sundry other current accounts had been paid, there remained little more than 430 francs to offer to the widow. The lady was properly indignant, not wholly, as she volubly explained, on account of the suggested writing-off of 170 francs, but also at the
50 attempt to depreciate the value of her late husband's acknowledged masterpiece. In a week's time Deplis was obliged to reduce his offer to 405 francs, which circumstance fanned the widow's indignation into a
55 fury. She cancelled the sale of the work of art, and a few days later Deplis learned with a sense of consternation that she had presented it to the municipality of Bergamo, which had gratefully accepted it. He left the

CONTINUE 

neighbourhood as unobtrusively as possible, and was genuinely relieved when his business commands took him to Rome, where he hoped his identity and that of the famous picture might be lost sight of.

“But he bore on his back the burden of the dead man’s genius. On presenting himself one day in the steaming corridor of a vapour bath, he was at once hustled back into his clothes by the proprietor, who was a North Italian, and who emphatically refused to allow the celebrated Fall of Icarus to be publicly on view without the permission of the municipality of Bergamo. Public interest and official vigilance increased as the matter became more widely known, and Deplis was unable to take a simple dip in the sea or river on the hottest afternoon unless clothed up to the collar-bone in a substantial bathing garment. Later on the authorities of Bergamo conceived the idea that salt water might be injurious to the masterpiece, and a perpetual injunction was obtained which debarred the muchly harassed commercial traveller from sea bathing under any circumstances. Altogether, he was fervently thankful when his firm of employers found him a new range of activities in the neighbourhood of Bordeaux. His thankfulness, however, ceased abruptly at the Franco-Italian frontier. An imposing array of official force barred his departure, and he was sternly reminded of the stringent law which forbids the exportation of Italian works of art.

1

Which choice best summarizes the passage?

- A) A man is unable to display a work of art.
- B) A man is forced to consider whether or not to obey the law.
- C) A man finds his choices restricted because of the result of an unpaid debt.
- D) A man tries to steal art to please a deceased relative.

2

The passage most clearly suggests that Henri Deplis’ financial status before receiving the legacy was

- A) chaotic.
- B) meager.
- C) wealthy.
- D) destitute.

3

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

- A) Lines 8–9 (“Henri . . . Luxemburg”)
- B) Lines 16–18 (“It was . . . extravagances”)
- C) Lines 21–25 (“Signor . . . back”)
- D) Lines 42–44 (“The legacy . . . proportions”)

4

In line 38, “exercise” most nearly means

- A) express beliefs.
- B) increase strength.
- C) practice repeatedly.
- D) ability to perform.

5

The journalist implies that the cherubs on Pincini’s tombstone were

- A) artistic subjects.
- B) religious icons.
- C) particularly tiny.
- D) plain stone.

CONTINUE 

6

The journalist indicates that Deplis reduced his offer to 405 francs because he

- A) thought he could trick Pincini's widow.
- B) could no longer afford the 430 francs.
- C) wanted to annoy the widow.
- D) thought she would accept a lower offer.

7

The author's statement that the widow "cancelled the sale of the work of art" (line 54) chiefly serves to

- A) show that Deplis had to return the art.
- B) preview Deplis' inability to travel.
- C) demonstrate the unpleasant temper of the widow.
- D) introduce an unexpected shift in perspective.

8

In line 67, "celebrated" most nearly means

- A) welcomed.
- B) famous.
- C) decorated.
- D) endless.

9

As presented in the passage, the trouble Henri Deplis encountered due to his tattoo is most accurately described as

- A) socially awkward but well-intended.
- B) well-deserved but clearly cruel.
- C) obviously absurd but persistently troublesome.
- D) uncomfortably restrictive but secretly flattering.

10

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

- A) Lines 57–61 ("He left . . . of")
- B) Lines 62–63 ("But he . . . genius")
- C) Lines 78–81 ("Altogether . . . Bordeaux")
- D) Lines 82–85 ("An imposing . . . art")

CONTINUE 

Questions 11–20 are based on the following passage and supplementary material.

This passage is adapted from Emily Grubert, “Renewable natural gas may sound green, but it’s not an antidote for climate change.” Originally published in 2020 in *The Conversation*: <https://theconversation.com/>.

Natural gas is a versatile fossil fuel that accounts for about a third of U.S. energy use. Although it produces fewer greenhouse gas emissions and other pollutants than coal or oil, natural gas is a major contributor to climate change, an urgent global problem. Reducing emissions from the natural gas system is especially challenging because natural gas is used roughly equally for electricity, heating, and industrial applications. There’s an emerging argument that maybe there could be a direct substitute for fossil natural gas in the form of renewable natural gas (RNG)—a renewable fuel designed to be nearly indistinguishable from fossil natural gas. RNG could be made from biomass or from captured carbon dioxide and electricity.

Based on what’s known about these systems, however, I believe climate benefits might not be as large as advocates claim. This matters because RNG isn’t widely used yet, and decisions about whether to invest in it are being made now, in places like California, Oregon, Washington, Michigan, Georgia and New York. As someone who studies sustainability, I research how decisions made now might influence the environment and society in the future. I’m particularly interested in how energy systems contribute to climate change. Right now, energy is responsible for most of the pollution worldwide that causes climate change. Since energy infrastructure, like power plants and pipelines, lasts a long time, it’s important to consider the climate change emissions that society is committing to with new investments in these systems. At the moment, renewable natural gas is more a proposal than reality, which makes this a great time to ask: What would investing in RNG mean for climate change?

If RNG could be a renewable replacement for fossil natural gas, why not move ahead? Consumers have shown that they are willing to buy renewable electricity, so we might expect similar enthusiasm for RNG. The key issue is that methane isn’t just a fuel—it’s also a potent greenhouse gas that contributes to climate change. Any methane that is manufactured

intentionally, whether from biogenic or other sources, will contribute to climate change if it enters the atmosphere. And releases will happen, from newly built production systems and existing, leaky transportation and user infrastructure. For example, the moment you smell gas before the pilot light on a stove lights the ring? That’s methane leakage, and it contributes to climate change.

To be clear, RNG is almost certainly better for the climate than fossil natural gas because byproducts of burning RNG won’t contribute to climate change. But doing somewhat better than existing systems is no longer enough to respond to the urgency of climate change. The world’s primary international body on climate change suggests we need to decarbonize by 2030 to mitigate the worst effects of climate change. My recent research suggests that for a system large enough to displace a lot of fossil natural gas, RNG is probably not as good for the climate as is publicly claimed. Although RNG has lower climate impact than its fossil counterpart, likely high demand and methane leakage mean that it probably will contribute to climate change. In contrast, renewable sources such as wind and solar energy do not emit climate pollution directly.

What’s more, creating a large RNG system would require building mostly new production infrastructure, since RNG comes from different sources than fossil natural gas. Such investments are both long-term commitments and opportunity costs. They would devote money, political will and infrastructure investments to RNG instead of alternatives that could achieve a zero greenhouse gas emission goal. When climate change first broke into the political conversation in the late 1980s, investing in long-lived systems with low but non-zero greenhouse gas emissions was still compatible with aggressive climate goals. Now, zero greenhouse gas emissions is the target, and my research suggests that large deployments of RNG likely won’t meet that goal.

CONTINUE 

Figure 1

U.S. Primary Energy Production by Source

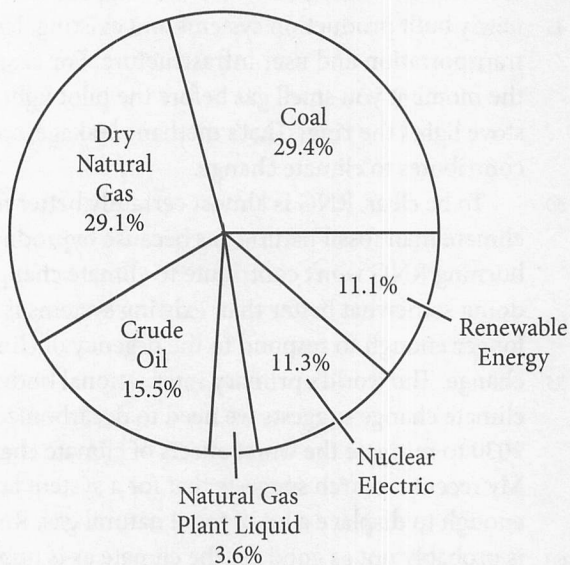


Figure 2

U.S. Primary Energy Consumption by Source

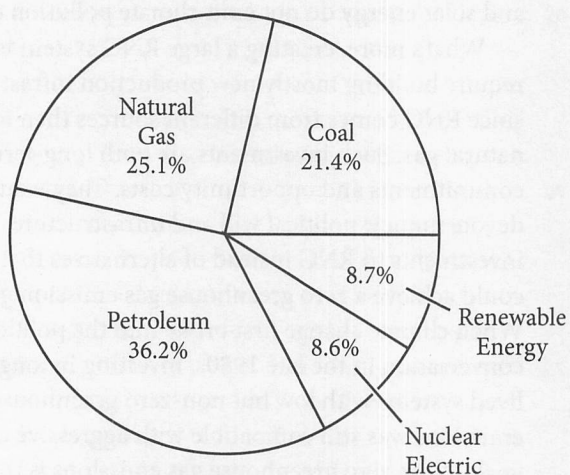


Figure 1 and figure 2 are adapted from U.S. Energy Information Agency data for the year 2010.

11

What function does the first paragraph (lines 1–14) serve in the passage as a whole?

- A) It argues definitively for adopting an alternative which the passage as a whole presents unfavorably.
- B) It introduces a potential solution that the author of the passage ultimately rejects.
- C) It supports with examples claims made in the last two paragraphs of the passage.
- D) It provides a summary of a challenge not fully understood by the consumers mentioned in the passage.

12

The central idea of the second paragraph (lines 15–34) is that

- A) energy systems require a significant investment in infrastructure.
- B) several U.S. states are considering implementing RNG systems.
- C) the climate impact of RNG should be investigated.
- D) RNG will contribute significantly to climate change.

13

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

- A) Lines 15–17 (“Based . . . claim”)
- B) Lines 17–21 (“This . . . York”)
- C) Lines 23–25 (“I’m particularly . . . change”)
- D) Lines 27–31 (“Since . . . systems”)

CONTINUE

14

Which choice does the author explicitly cite as a disadvantage of using renewable natural gas as an energy source?

- A) Energy independence
- B) Increased utility costs
- C) Safety concerns
- D) Escaped gases

15

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

- A) Lines 31–34 (“At the . . . change”)
- B) Lines 44–46 (“And releases . . . infrastructure”)
- C) Lines 50–52 (“To be . . . change”)
- D) Lines 64–65 (“In contrast . . . directly”)

16

As used in line 55, “primary” most nearly means

- A) principal.
- B) unmediated.
- C) simple.
- D) first.

17

As used in line 77, “aggressive” most nearly means

- A) brash.
- B) dominating.
- C) ambitious.
- D) combative.

18

Which choice best supports the conclusion that preparations for using renewable natural gas could disrupt the development of other energy sources?

- A) Lines 66–69 (“What’s . . . gas”)
- B) Lines 69–70 (“Such . . . costs”)
- C) Lines 70–73 (“They . . . goal”)
- D) Lines 74–78 (“When . . . goals”)

19

Which choice is supported by the data in the first figure?

- A) Renewable energy production is equal to energy production from crude oil.
- B) Nuclear electric power production exceeds natural gas plant liquid production.
- C) The amount of energy produced from renewable sources is greater than the amount of energy produced from coal.
- D) Renewable energy is produced less efficiently than energy produced from crude oil.

20

Taken together, the two figures suggest that renewable energy sources

- A) are in high demand in urban areas but consumed less frequently in rural areas.
- B) are in higher demand in areas where consumers protest the use of fossil fuels.
- C) account for less than half of energy production and consumption.
- D) account for less than half of total energy production but more than half of total energy consumption.

CONTINUE 

Questions 21–30 are based on the following passage.

This passage is adapted from Riley Black, *Fossil Footprints Help Uncover the Mysteries of Bipedal Crocodiles*. ©2020 by *Scientific American*.

Line More than 113 million years ago, a strange reptile
lived in what is now South Korea. It strode around
on two legs like many dinosaurs, yet it was not one
of them. The tracks it left behind indicate it was a
5 relative of today’s crocodiles. And the details of its
Cretaceous footfalls resolve one mystery—but open
another.

Footprints like these had been found before,
though in much older rocks. During the Triassic
10 period (between 252 million and 201 million years
ago) crocodile relatives—part of a group known as
crocodylomorphs—were the dominant reptiles on
land, and they included animals that resembled some
dinosaurs by walking on two legs. These forms went
15 extinct at the end of the period, yet the geologically
younger tracks from South Korea’s Jinju Formation
represent a bipedal crocodylomorph that lived long
after the Triassic closed.

Paleontologist Kyung Soo Kim of Chinju National
20 University of Education in South Korea, fossil
footprint expert Martin Lockley of the University
of Colorado Denver and their colleagues describe
the puzzling fossil tracks. Lockley calls South Korea
a “tracker’s heaven” for paleontologists because
25 of the sheer number of fossil footprints found in
the country. Last November, he says, Kim had
asked for his opinion on large Cretaceous tracks
uncovered at the site. The prints looked similar to
those attributed to pterosaurs, flying reptiles from
30 the Age of Dinosaurs, that were walking on the
ground. But Lockley recognized them as something
else. “I immediately saw that they were of the type
known as *Batrachopus*,” or a form of track attributed
to crocodile relatives from the early part of the
35 Jurassic (201 million to 145 million years ago). These
footprints not only were much larger than any other
known *Batrachopus* tracks, but they also indicated
that the animals at the site walked on two legs—
and were present for millions of years more in the
40 Cretaceous period.

The presence of bipedal crocs at the fossil site was
unexpected. The discovery does help address another
fossil mystery, however. At a different South Korean
location known as Gain-ri, there are tracks that were

45 also previously believed to be left by large pterosaurs.
Tracks found elsewhere in the world indicate that
the flying reptiles folded their wings to waddle on
all fours while on the ground. But researchers had
thought the prints at Gain-ri were made by pterosaurs
50 that moved on two legs to avoid dragging their wings
through the muck.

The new fossils have changed the analysis of
these tracks—and have undercut interpretations
of pterosaurs walking on two legs at other sites.
55 Pterosaur expert Liz Martin-Silverstone of the
University of Bristol in England, who was not
involved in the new study, agrees that the presumed
“pterosaur” tracks at Jinju look much more like
prints made by crocodile relatives than those left by
60 pterosaurs. In fact, she notes, “all previously described
bipedal ‘pterosaur’ trackways have come out as
crocodilian upon reexamination”—which dovetails
with skeletal evidence indicating these prehistoric
flappers tottered around on four legs while on the
65 ground.

With the new find, paleontologists now know
of at least two fossil sites that apparently record the
bipedal footsteps of Cretaceous crocodylomorphs—
not those of pterosaurs acting unusually. “This new
70 footprint evidence shows we have to rethink the crocs
of yesteryear and regard some as agile land dwellers,”
Lockley says. Although crocodiles are often cast as
“living fossils” that have changed little since their
origin in the Triassic, skeletal and track evidence has
75 shown that crocs in the Age of Dinosaurs were varied,
active animals that often looked very different from
the swimming ambush predators we are familiar with
today.

CONTINUE 

21

Which choice best reflects the overall sequence of events in the passage?

- A) A discovery is made; comparisons with prior findings reveal new information, and a previous theory is altered to reflect the new understanding.
- B) A group of scientists collaborate on their field research; they change their predictions, and the results are verified and published.
- C) An expert is consulted; a previous research site is revisited, and scientists retain their original line of thinking.
- D) Current research is examined and critiqued; an older theory is revived and confirmed through a new study, and further research is proposed.

22

The passage indicates that South Korea is an ideal site for studying ancient species due to

- A) the presence of scientists working there.
- B) the nearby university.
- C) the abundance of fossils.
- D) the ease of fossil excavation.

23

After uncovering the “puzzling fossil tracks,” (line 23) Kyung Soo Kim

- A) attempted to prove that the tracks belonged to flying reptiles.
- B) studied the movements of *Batrachopus*.
- C) compared the footprints with modern dinosaur relatives.
- D) asked a colleague for assistance in identifying the tracks.

24

As used in line 31, “recognized” most nearly means

- A) reinvented.
- B) identified.
- C) showed appreciation for.
- D) gave credit to.

25

In the fourth paragraph (lines 41–51) the description of pterosaurs’ behavior mainly serves to

- A) present a theory undermined by the identification of the Jinju Formation fossils.
- B) outline the hypothesis that Kim intended to disprove.
- C) describe a species that is no longer thought to have existed.
- D) demonstrate a difference between researchers’ methods.

26

Which statement best captures an assumption researchers made in changing their theory that pterosaurs walked on two legs?

- A) Tracks of different animals would appear somewhat similar due to geological differences at the Gain-ri and Jinju sites.
- B) Insights about tracks at one location can be applied to similar tracks at another location.
- C) Flying reptiles of the Cretaceous period were more likely than crocodiles of the same period to walk on two legs.
- D) *Batrachopus* and pterosaurs both evolved during the Jurassic period.



27

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

- A) Lines 41–42 (“The presence . . . unexpected”)
- B) Lines 46–48 (“Tracks . . . ground”)
- C) Lines 55–60 (“Pterosaur . . . pterosaurs”)
- D) Lines 69–72 (“This . . . says”)

28

As used in line 72, “cast” most nearly means

- A) studied.
- B) served.
- C) described.
- D) molded.

29

What can reasonably be inferred about modern crocodiles from the passage?

- A) They may differ in appearance from their ancient crocodylian relatives.
- B) They would be the dominant species on land if they spent less time in the water.
- C) Their movement is similar to the movement of their prehistoric counterparts.
- D) Their footprints are much larger than those of other reptiles.

30

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

- A) Lines 9–14 (“During . . . legs”)
- B) Lines 35–40 (“These . . . period”)
- C) Lines 52–53 (“The new . . . tracks”)
- D) Lines 72–78 (“Although . . . today”)

CONTINUE

Questions 31–41 are based on the following passages.

Passage 1 is adapted from a letter from Thomas Jefferson to John Adams, October 28, 1813. Passage 2 is adapted from a letter from John Adams to Thomas Jefferson, November 15, 1813. Jefferson and Adams are discussing whether aristocracy is inherited.

Passage 1

For I agree with you that there is a natural aristocracy among men. The grounds of this are virtue and talents.

Line There is also an artificial aristocracy founded on
5 wealth and birth, without either virtue or talents; for with these it would belong to the first class. The natural aristocracy I consider as the most precious gift of nature, for the instruction, the trusts, and government of society. And indeed it would have
10 been inconsistent in creation to have formed man for the social state, and not to have provided virtue and wisdom enough to manage the concerns of the society. May we not even say that that form of government is the best which provides the most effectually for a pure
15 selection of these natural aristoi into the offices of government? The artificial aristocracy is a mischievous ingredient in government, and provision should be made to prevent its ascendancy.

I think the best remedy is exactly that provided by
20 all our constitutions, to leave to the citizens the free election and separation of the aristoi from the pseudo-aristoi, of the wheat from the chaff. In general, they will elect the really good and wise. In some instances, wealth may corrupt, and birth blind them; but not
25 in sufficient degree to endanger the society. But even in Europe a change has sensibly taken place in the mind of Man. Science had liberated the ideas of those who read and reflect, and the American example had kindled feelings of right in the people. An insurrection
30 has consequently begun, of science, talents and courage against rank and birth, which have fallen into contempt.

This however we have no right to meddle with. It suffices for us, if the moral and physical condition
35 of our own citizens qualifies them to select the able and good for the direction of their government, with a recurrence of elections at such short periods as will enable them to displace an unfaithful servant before the mischief he meditates may be irremediable.

Passage 2

40 We are now explicitly agreed, in one important point, that “there is a natural aristocracy among men; the grounds of which are virtue and talents.”

But though we have agreed in one point, in words, it is not yet certain that we are perfectly agreed in
45 sense. Fashion has introduced an indeterminate use of the word “talents.” Education, wealth, strength, beauty, stature, birth, marriage, graceful attitudes and motions, gait, air, complexion, and physiognomy are talents, as well as genius and science and learning. Any one of
50 these talents, that in fact commands or influences true votes in society, gives to the man who possesses it the character of an aristocrat, in my sense of the word.

Your distinction between natural and artificial aristocracy does not appear to me well founded. Birth
55 and wealth are conferred on some men as imperiously by Nature, as genius, strength or beauty. The heir is honors and riches, and power has often no more merit in procuring these advantages than he has in obtaining a handsome face or an elegant figure.
60 When aristocracies are established by human laws, and honor, wealth, and power are made hereditary by municipal laws and political institutions, then I acknowledge artificial aristocracy to commence: but this never commences, till corruption in elections
65 becomes dominant and uncontrollable. But this artificial aristocracy can never last. The everlasting envies, jealousies, rivalries and quarrels among them, their cruel rapacities upon the poor ignorant people their followers, compel these to set up Caesar, a
70 demagogue to be a monarch and master. Here you have the origin of all artificial aristocracy, which is the origin of all monarchy. And both artificial aristocracy, and monarchy, and civil, military, political and hierarchical despotism, have all grown out of the
75 natural aristocracy of “virtues and talents.”

Your distinction between the aristoi and pseudo-aristoi, will not help the matter. I would trust one as soon as the other with unlimited power. The law wisely
80 refuses an oath as a witness in his own cause to the saint as well as to the sinner.

CONTINUE 

31

As used in line 20, “free” most nearly means

- A) complimentary.
- B) available.
- C) unrestricted.
- D) gratuitous.

32

It can be inferred that the author of Passage 1 believes the best way to prevent the rise of the artificial aristocracy is to

- A) allow those with power to pass that power to their children.
- B) run America the same way the Europeans run their countries.
- C) require voters to vote only for the best and wisest candidates.
- D) allow voters to choose their own leaders.

33

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

- A) Lines 4–6 (“There . . . class”)
- B) Lines 16–18 (“The artificial . . . ascendancy”)
- C) Lines 19–22 (“I think . . . chaff”)
- D) Lines 25–27 (“But even . . . Man”)

34

As used in line 45, “fashion” most nearly means

- A) convention.
- B) demeanor.
- C) model.
- D) construction.

35

According to the author of Passage 2, an artificial aristocracy begins only when

- A) laws give one group power over another.
- B) all people are given the right to vote.
- C) a democracy turns into a monarchy.
- D) those who are virtuous and talented control the government.

36

In Passage 2, the author claims that political advantages come mainly from

- A) birth and wealth.
- B) a wide range of characteristics.
- C) physical attributes.
- D) municipal laws and political institutions.

37

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

- A) Lines 40–42 (“We are . . . talents”)
- B) Lines 49–52 (“Any one . . . word”)
- C) Lines 54–56 (“Birth . . . beauty”)
- D) Lines 60–65 (“When . . . uncontrollable”)

38

In lines 76–80, the author of Passage 2 refers to a statement made in Passage 1 in order to

- A) question the working vocabulary of the author of Passage 1.
- B) argue against the central theme of Passage 1.
- C) agree with the logic of the proposal outlined in Passage 1.
- D) point out a perceived flaw in the argument made in Passage 1.



39

Which best describes the overall relationship between Passage 1 and Passage 2?

- A) Passage 2 further develops a distinction presented in Passage 1.
- B) Passage 2 disagrees with a key assumption of Passage 1.
- C) Passage 2 considers the historical context of statements made in Passage 1.
- D) Passage 2 redefines key terms used in the argument in Passage 1.

40

The authors of both passages would most likely agree with which of the following statements about advantages people may have over each other?

- A) Those born talented and virtuous have an advantage over those who aren't.
- B) Wealth and power are more important than beauty and talent.
- C) Advantages one gains later in life are more powerful than those one is born with.
- D) There is a clear distinction between those who earn their power and those who have it handed to them.

41

How would the author of Passage 1 most likely respond to the points made in Passage 2 (lines 60–75)?

- A) Passing power down through families will lead to governments run like those in Europe.
- B) Although a few who are unfit may be elected, leaving the decisions in the hands of the voters will ultimately keep the system balanced.
- C) Rank and birth are more highly prized than science and talent.
- D) The setup of the American system could allow for an unfaithful leader to cause irremediable damage.

CONTINUE 

Questions 42–52 are based on the following passage and supplementary material.

This passage is adapted from Nicolaas Bouwes et al., “Ecosystem Experiment Reveals Benefits of Natural and Simulated Beaver Dams to a Threatened Population of Steelhead (*Oncorhynchus mykiss*).” ©2016 by Scientific Reports.

Beaver in Eurasia and North America were once abundant and ubiquitous. Their dense and barbed fur has great felting properties, and as early as the 1500s, intense trapping to provide pelts mainly for making hats occurred throughout Eurasia. When Lewis and Clark explored the Pacific Northwest in 1805, salmon and steelhead coexisted with beavers in very high densities. When the British and United States jointly occupied the Oregon Territories (which included the Columbia River Basin), the Hudson Bay Company implemented their “scorched earth” or “fur desert” policy to eliminate all fur-bearing animals, in an attempt to discourage American settlement. As a result, beaver were nearly extirpated from the region by 1900.

Around this time, a decrease in the great harvests of Pacific salmon and steelhead was first perceived. Anadromous salmon and steelhead populations have since declined precipitously in the Columbia River Basin, leading to their listing under the U.S. Endangered Species Act (ESA). Human activities, including the removal of beaver, have exacerbated the occurrence of stream channel incision, where a rapid down-cutting of the stream bed disconnects the channel from its floodplain. We hypothesized that beaver dams or simulated beaver dams that we construct (referred to as beaver dam analogs or BDAs) can greatly accelerate the incision recovery process.

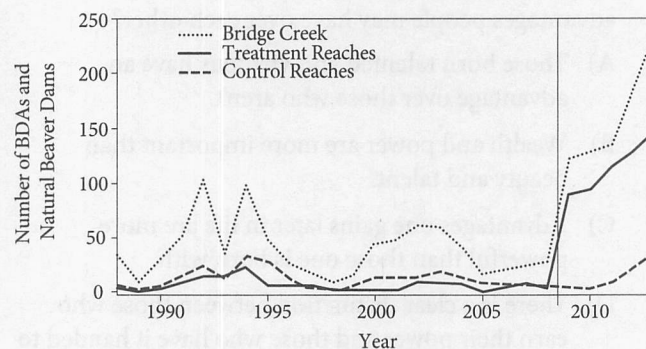
BDAs were built by pounding wooden fence posts vertically into the channel bed and potential floodplain surfaces. Willow branches were woven between the posts, and bed sediment was used to plug the base of structures. The addition of BDAs into Bridge Creek led to an immediate and rapid increase in the number of natural beaver dams, not only in our treatment areas but throughout much of Bridge Creek. Whether their dam-building activities increased because of a demographic or behavioral response is somewhat immaterial, because the modification of the stream ecosystem, rather than the beavers themselves, likely caused the fish population response.

BDAs and beaver dams led to large changes in both fish and beaver habitat, and the steelhead population response largely followed our hypothesized pathways.

We found compelling evidence that beavers increased the quantity of juvenile habitat.

Increasing habitat complexity may also partially explain the observed increase in total juvenile abundance, survival and productivity. Increased habitat complexity provides fish a greater selection of locations at which to forage, rest, and avoid predation and high flow events, while reducing migration distances required to conduct these activities for multiple life-stages. Thus, we suspect that an increase in habitat complexity is partly responsible for the observed positive steelhead population responses.

Number of Dams Over Time



The panel represents the total number of dams for the Bridge Creek (dotted line), the sum of all treatment (solid line), and all control (dashed line) reaches. The black vertical line represents when BDAs were initially installed.

42

As used in line 22, “removal” most nearly means the

- A) significant reduction of a population.
- B) surgical extraction of an item.
- C) complete extinction of a species.
- D) physical relocation of an individual beaver.

CONTINUE

43

In line 56, the authors state that certain hypothesized results were largely consistent with “steelhead population responses.” According to the passage, which of the following best represents the broader hypothesis the authors tested in order to obtain those results?

- A) Artificial beaver dams can be constructed by the placement of wooden posts and cross-woven willow branches without obstructing the development of natural dams.
- B) Reconnecting a stream’s channel and floodplain can occur more quickly through the construction of natural or artificial beaver dams.
- C) The removal of an animal from its habitat can lead to unexpected results throughout an ecosystem.
- D) Stream channel incision, caused by the rapid down-cutting of a stream bed, is exacerbated by the presence of unexpectedly large numbers of beaver dams.

44

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

- A) Lines 16–17 (“Around . . . perceived”)
- B) Lines 21–25 (“Human . . . floodplain”)
- C) Lines 25–28 (“We hypothesized . . . process”)
- D) Lines 29–31 (“BDAs . . . surfaces”)

45

The primary purpose of the third paragraph (lines 29–41) is to

- A) illustrate methods and results of research to determine the impact of beaver dams on stream ecosystems.
- B) detail the findings of research designed to investigate beaver responses to competition from other dams.
- C) describe the plan that will be followed by the hypothetical experiment referenced in the fifth paragraph (lines 47–56).
- D) suggest a method by which a potential experiment could be carried out in the future in order to test the strength of beaver dams.

46

The passage most clearly indicates that the authors’ Bridge Creek BDA building efforts had which of the following indirect effects?

- A) They temporarily disturbed the local wildlife populations.
- B) They reduced the downstream water flow.
- C) They prompted beavers to build more natural dams.
- D) They increased local beaver populations.

47

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

- A) Lines 13–15 (“As a . . . 1900”)
- B) Lines 33–36 (“The addition . . . Creek”)
- C) Lines 36–41 (“Whether . . . response”)
- D) Lines 49–54 (“Increased . . . life-stages”)



48

The words “partially,” “suspect,” and “partly” in the fifth paragraph (lines 47–56) have which effect on the tone of the paragraph?

- A) They indicate an insecure tone that displays the depth of the authors’ nervousness about how the new research will be received.
- B) They indicate an objective tone that states facts while also allowing for the possibility that other factors may be important.
- C) They indicate a conceding tone that grudgingly accepts unwelcome results of the conducted research on the effects of artificial dams.
- D) They create a suspicious tone that suggests the authors are afraid that they may have missed crucial implications of their research.

49

An unstated assumption of the experiment described in the passage is that habitat complexity

- A) was at its greatest before 1900.
- B) is always increased by the addition of dams.
- C) is detrimental to most types of predator populations in stream-based ecosystems.
- D) was not maximized before the construction of the BDAs.

50

According to the data in the figure, what was the greatest number of dams on Bridge Creek during the twenty years prior to the installation of BDAs?

- A) 105 dams
- B) 125 dams
- C) 150 dams
- D) 225 dams

51

Based on the data in the figure, which of the following years represents the last year during which a control reach had a greater number of dams than a treatment reach?

- A) 1995
- B) 2000
- C) 2007
- D) 2012

52

Does the graphic support the author’s claim that increasing the number of real or simulated beaver dams leads to an increase in steelhead populations?

- A) Yes, because the initial construction of BDAs led directly and significantly to steep increases in natural dams along all the treated stream systems.
- B) Yes, because the data in the figure indicate that the construction of BDAs led to an increase in the steelhead populations.
- C) No, because the data does not provide a link between the number of dams and the quality of steelhead habitats.
- D) No, because the data does not show that floodplain access is significantly increased by the presence of dams.

STOP

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

Writing and Language Test

25 MINUTES + QUESTIONS

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

ANSWERS

Each passage below is followed by a question or two. For each question, you will consider how the passage might be improved. For each question, you will consider how the passage might be improved. For each question, you will consider how the passage might be improved.

No Test Material On This Page

After reading each passage, choose the answer that best improves the passage. You will be asked to choose the answer that best improves the passage. You will be asked to choose the answer that best improves the passage.

Question 1-11 are based on the following passage.

From left to right, the illustrations show the process of a person's life. The first illustration shows a person in a field, looking at a book. The second illustration shows a person in a field, looking at a book. The third illustration shows a person in a field, looking at a book.

With the help of the following passage, you will be able to answer the questions. The passage is followed by a question or two. For each question, you will consider how the passage might be improved.

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.

Paternal Instincts: The Case for Paternity Leave

From high-rise office buildings to massive manufacturing plants, the main focus in any workplace is generally on what employees are being paid to do, but **1** the personal needs of workers must also be addressed for a modern company to maximize its potential for success. After all, it is no longer the dawn of the Industrial Age. Children are no longer used as part of the workforce, paid days off are commonplace, and a safe working environment is the rule rather than the exception. Contemporary employers **2** of today understand that providing for the safety and security of an employee, and an employee’s family, can improve not only quality of life, but also the company’s production.

1

Which choice provides the most appropriate introduction to the passage?

- A) NO CHANGE
- B) work isn’t the only thing.
- C) many companies also care about profit as well.
- D) companies could do everything possible to make all employees happy.

2

- A) NO CHANGE
- B) today
- C) of right now
- D) DELETE the underlined portion.

CONTINUE 

There is no more important event for a family than the birth of a child, and many companies offer paid maternity leave to mothers in order to ease the natural burden that families experience during this time. However, significantly fewer companies offer the male equivalent—paid paternity leave. A 2012 study conducted **3** from the United States Department of Labor found that only 13 percent of men who took paternity leave received pay compared to 21 percent of women who took maternity leave. The same study found that maternity leave averages six to twelve weeks in length. Of the men who reported taking leave following the birth of a child, 70 percent indicated that they took a paternity leave **4** they are at most ten days long.

3

- A) NO CHANGE
- B) by
- C) of
- D) DELETE the underlined portion.

4

- A) NO CHANGE
- B) that was
- C) they were
- D) those being

CONTINUE 

This pronounced deficit in leave **5** is important for two reasons. The first is that companies might not only increase the happiness of their workforce, but also retain high-skilled workers who could be tempted to leave for another company offering better paternity benefits. A 2014 study by the U.S. Bureau of Labor and Statistics found that nine out of ten men considered paternity leave to be a factor of at least marginal importance when considering employment opportunities. **6** Others considered it to be less important. **7** Clearly, this is becoming a more important issue to the newest additions to the workforce.

5

- A) NO CHANGE
- B) are
- C) is being
- D) had been

6

Which choice best supports the statement made in the previous sentence?

- A) NO CHANGE
- B) But not as important as mothers having time off.
- C) But others did not seem to think it mattered.
- D) Six out of ten considered it to be extremely important.

7

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

The younger a male respondent was, the more likely he was to rate the issue of paternity leave as important when considering employment.

Should the writer make this addition?

- A) Yes, because it provides a reason for the assertion made in the last sentence of the paragraph.
- B) Yes, because it supplies qualitative data that is challenged in the remainder of the paragraph.
- C) No, because it interrupts the discussion of what is important to older fathers.
- D) No, because it does not take into account whether workers were actually fathers or not.

CONTINUE 

8 However, paternity leave is not just about what potential employees want. There is a second reason that paternity leave policies are so important; they bring attention to a larger societal issue. Not enough emphasis has been placed on the importance of both **9** parent's being involved in the earliest stages of a child's life.

Paternity leave allows fathers to bond with their children earlier, participate in the household more **10** actively, and, raise children with a greater sense of gender equality.

11 In other words, paternity leave not only benefits a lone employee and his or her family—it improves society as a whole.

8

In context, which choice best combines the underlined sentences?

- A) However, another reason that paternity leave is so important is that they bring attention to a larger societal issue that is also what potential employees want.
- B) However, a second reason is about what potential employees want and paternity leave having an impact on an entire society.
- C) Beyond being something potential employees desire, paternity leave policies are also important because they highlight a larger societal issue.
- D) Employees want paternity leave, so another important reason to take it seriously in our society is that these policies involve a larger societal issue.

9

- A) NO CHANGE
- B) parent's being involved in the earliest stages of a childs
- C) parents being involved in the earliest stages of a child's
- D) parents being involved in the earliest stages' of a childs

10

- A) NO CHANGE
- B) active, and raise
- C) actively, and raise
- D) actively and raising

11

- A) NO CHANGE
- B) Otherwise,
- C) Completely,
- D) Alternatively,



Questions 12–22 are based on the following passage.

The Divided Elections of America

The cyclical nature of American federal elections is one aspect of American life common to all fifty states. However, once you move past the cycle and look at the voting mechanisms themselves, similarities are hard to come by. **12** One major difference among the states pertaining to elections for federal offices, for example presidential or congressional **13** candidates. Is whether a state holds a primary or a caucus. These two systems, primaries and caucuses, are meant to accomplish the same **14** goal; nominate major-party candidates for office.

12

- Which choice provides the most logical introduction to the sentence?
- A) NO CHANGE
 - B) All states vote for the same offices on the same cycle
 - C) The main questions for all democratic nations and their elections,
 - D) DELETE the underlined portion, and begin the next sentence with a capital letter.

13

- A) NO CHANGE
- B) candidates:
- C) candidates; is
- D) candidates, is

14

- A) NO CHANGE
- B) goal
- C) goal, and
- D) goal:

**CONTINUE**

Because the goal of each of these systems is the same, it can be surprising how fundamentally different primaries and caucuses are. Caucuses, for example, are strictly limited to the members of a single political party. If a caucus is the preferred method of election, these state-level party members will convene a meeting, called a caucus, to select candidates or decide policy. At this caucus, members of that single political party meet in person at an appointed time and location to discuss the candidates and debate their merits based on the party platform. **15** The voting for candidates then happens manually.

Primaries, on the other hand, involve an election that narrows the field of major-party candidates before an election for office. Additionally, primaries may be declared as “open,” which means that they are not limited to participation by a single political party as caucuses are. In primaries, non-affiliated and affiliated voters may present **16** themselves at their respective precincts and cast their votes privately.

15

The writer is considering revising the underlined sentence to read:

The voting for candidates then happens manually, either by a raised hand count or by separating into groups for a tally.

Should the writer add this information here?

- A) Yes, because it provides examples of why caucuses are more effective than primaries.
- B) Yes, because it further explains the assertion made in the sentence.
- C) No, because it should be placed later in the passage.
- D) No, because it contradicts the main claim of the passage.

16

- A) NO CHANGE
- B) himself or herself
- C) their selves
- D) oneself



Historically, caucuses made a great deal of practical sense. **17** In the late 18th century it was difficult for candidates to share information with potential voters or campaign on a large geographical scale. Much of the voting **18** population had limited, if any, knowledge of the candidates or party platforms before traveling to designated centers to actually cast a vote. **19** Caucuses allowed voters who were limited in their knowledge to learn firsthand from representatives of the candidates what the party platform was and what positions the candidates had on issues within that platform. Voters then selected representatives who were pledged to the candidate the voters had chosen.

17

The writer is considering deleting the previous sentence. Should the writer make this change?

- A) Yes, because it does not logically follow from the previous paragraph.
- B) Yes, because it introduces information that is irrelevant at this point in the passage.
- C) No, because it provides a specific example in support of arguments made elsewhere in the passage.
- D) No, because it provides a logical introduction to the paragraph.

18

- A) NO CHANGE
- B) population, had limited if any knowledge
- C) population had, limited, if any, knowledge
- D) population had limited if any knowledge,

19

Which choice most logically follows the previous sentence?

- A) The man who received the most votes would become president.
- B) Of course, not everyone who came voted in the same way.
- C) Functionally, voters directly voted for their caucus representatives, not the actual candidates.
- D) Local elections rarely used this system because candidates were always well known.

CONTINUE 

Over time, especially in this era of mass and social media, primaries have been steadily surpassing caucuses in popularity. Out of the fifty voting states and commonwealths, only 13 currently hold caucuses. This is due in part to the **20** horrid nature of caucuses in comparison to primaries. Not only are they difficult to keep organized, **21** it is also difficult to keep civil. In addition, caucuses have come to be perceived as less democratic because **22** it is an election of representatives rather than direct elections of candidates.

20

Which choice best maintains the tone established in the passage?

- A) NO CHANGE
- B) deplorable
- C) litigious
- D) inconvenient

21

- A) NO CHANGE
- B) but also they are
- C) but also being
- D) also being

22

- A) NO CHANGE
- B) it has been an election
- C) they are elections
- D) those have been an election

CONTINUE 

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

The Sloth: Nature’s Layabout or Efficient Mammal?

Many people believe that the sloth is an extremely lazy animal. This popular image of the sloth has its roots in both history and etymology. European explorers in South America, **23** they noticed the sloth’s slow and **24** lackadaisical movements, named the creature after one of the “Seven Deadly Sins.” **25** Recently, the sloth’s image is reinforced by Disney’s 2016 movie *Zootopia*. In this movie, Flash, a sloth, slows down the main characters by spending hours completing simple tasks. However, while it is true that the sloth typically moves slowly and spends a significant portion of **26** its day sleeping, this slow rate of activity is not due to laziness. Rather, the sloth has evolved this lifestyle in order to adapt to the particular challenges of consuming leaves located high in the rainforest canopy.

23

- A) NO CHANGE
- B) that
- C) which
- D) who

24

- A) NO CHANGE
- B) careless
- C) inactive
- D) leisurely

25

Which choice most effectively combines the underlined sentences?

- A) Flash, a sloth in the 2016 movie *Zootopia*, slows down the main characters by spending hours completing simple tasks, which reinforces the sloth’s image recently by Disney.
- B) Disney’s 2016 movie *Zootopia* reinforces this image by featuring a sloth, Flash, who slows down the main characters by spending hours completing simple tasks.
- C) Disney’s Flash, a sloth, slows down the main characters by spending hours completing simple tasks recently in *Zootopia*, reinforcing the sloth’s image.
- D) A sloth, Flash, slows down Disney’s 2016 movie *Zootopia*, reinforcing the sloth’s image and spending hours completing simple tasks.

26

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

CONTINUE 

[1] The sloth is categorized as a folivore because the bulk of its diet consists of the leaves, buds, and tender shoots of *Cecropia*, **27** that is a tree found in the tropical regions of Central and South America. [2] Take the sloth's **28** stomach for example, it is very large with multiple compartments. [3] These compartments contain bacteria that break down the leafy material. [4] It may take a sloth over a month to digest a meal of *Cecropia* leaves. [5] However, leaves and other non-fruit parts of trees are nutritionally poor, so the sloth has various adaptations to help it thrive on this diet. [6] Another, perhaps even more amazing dietary adaptation is the sloth's unusually low body temperature. **29**

27

- A) NO CHANGE
- B) it is
- C) being
- D) DELETE the underlined portion.

28

- A) NO CHANGE
- B) stomach, for example,
- C) stomach. For example,
- D) stomach, for example:

29

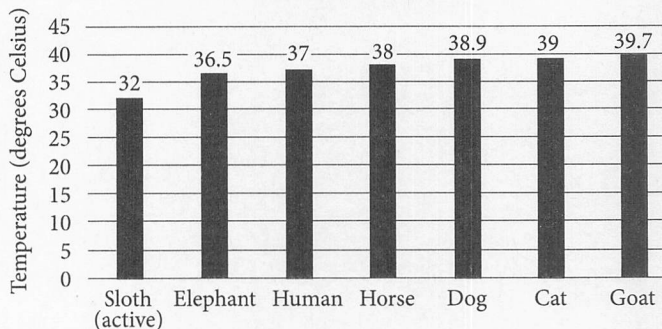
To make this paragraph most logical, sentence 5 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 3.
- D) after sentence 6.



Most mammals regulate their body temperature in part by creating heat through metabolic processes. Through normal body processes, heat is generated (more in the core organs than in the extremities), and this heat is spread throughout the body. This process of heat generation requires nutrition, and, as mentioned above, the sloth survives predominantly on tree products that are poor in nutrition. As the graph shows, this in part explains why the sloth has a body temperature approximately **30** five degrees Celsius lower than that of the other mammals shown, even when active. Furthermore, the sloth does not keep its body temperature in as limited a range as, for instance, a dog **31** has. A healthy dog's temperature will remain within 0.4 degree Celsius of its average, whereas a healthy sloth's temperature can be as much as 2 degrees Celsius warmer or cooler than its average body temperature when active. This means that a healthy **32** sloth's active body temperature can be greater than that of a healthy dog. This lower body temperature helps the sloth thrive on a nutritionally poor diet. The sloth's slow and steady lifestyle is therefore not the result of laziness, but rather the result of **33** popular culture's stereotypes about this animal as seen through the movie *Zootopia*.

Average Body Temperature of Various Mammals



Adapted from Gary Meisner, "Golden Ratio in Body Temperatures." Originally published May 13, 2012 by Goldennumber.net.

30

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

- A) NO CHANGE
- B) equal to
- C) five degrees greater than
- D) half

31

- A) NO CHANGE
- B) will.
- C) did.
- D) does.

32

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

- A) NO CHANGE
- B) dog's body temperature is greater than that of any mammal shown in the graph.
- C) dog's body temperature will be greater than that of a sloth, even when the sloth is active.
- D) active sloth will have a body temperature equal to that of a healthy dog.

33

The writer wants a conclusion that conveys how the sloth's inactivity is the result of adaptations to its diet. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) the unfortunate name given to the sloth by Europeans exploring the South American rainforest.
- C) keeping its body temperature lower than that of most other mammals.
- D) needing to survive off of a food source that, while abundant, is not a rich source of nutrients.

CONTINUE 

Questions 34–44 are based on the following passage.

Milton Babbitt: A Punny Composer

Typically, a pun is a form of word play suggesting that there are multiple interpretations of a word or phrase. Some puns—Oscar Wilde’s “The Queen is not a subject,” for **34** example use words that have multiple meanings. Other puns, such as the comedian George Carlin’s observation that “Atheism is a non-prophet organization,” **35** relies on words with different definitions, but that sound alike. From Shakespeare’s plays to Abbott and Costello’s *Who’s on First?* to even the **36** Bible, wordsmiths have used puns for humorous and rhetorical effect. However, puns aren’t just limited to words. One **37** punster, American composer, Milton Babbitt, has imported the use of puns into music.

34

- A) NO CHANGE
- B) example,
- C) example;
- D) example—

35

- A) NO CHANGE
- B) rely
- C) has relied
- D) relying

36

- A) NO CHANGE
- B) Bible. These wordsmiths
- C) Bible. Wordsmiths
- D) Bible; these wordsmiths

37

- A) NO CHANGE
- B) punster, American composer Milton Babbitt,
- C) punster, American composer, Milton Babbitt
- D) punster American composer Milton Babbitt,

CONTINUE

Two of Babbitt's works for percussion, *Homily* and *Beaten Paths*, show how he **38** writes effectively for the instruments chosen. *Homily*, for snare drum, uses dynamics (how loudly or softly a note is played) and timbre (the "color" of the note, changed by using different drumsticks) to change how similar musical phrases are audibly perceived. The musical phrase is **39** modified in such a way that different interpretations of the phrase are possible, much in the same way that verbal puns rely on concurrent interpretations of a word. Similarly, *Beaten Paths*, for marimba, also uses dynamics to create different musical meanings.

38

Which choice most effectively sets up the examples that follow?

- A) NO CHANGE
- B) has fun with the music in his compositions.
- C) creates puns in music by using the same musical idea in multiple ways.
- D) shows the absurdity of translating ideas from one type of work to another.

39

- A) NO CHANGE
- B) twisted
- C) doctored
- D) refined

CONTINUE 

Beaten Paths uses pitch to not only create repeated musical motifs, but also **40** reshaped the audience's perception of the music. **41** Beyond his music, Babbitt's use of puns even **42** extends to the titles of his works.

40

- A) NO CHANGE
- B) reshape
- C) have reshaped
- D) reshaping

41

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

Babbitt was one of the first to work in electronic music, producing his *Composition for Synthesizer* in 1961.

Should the writer make this addition here?

- A) Yes, because it helps to explain Babbitt's interest in puns.
- B) Yes, because it links Babbitt's music to literature.
- C) No, because it provides background information that is irrelevant to the paragraph.
- D) No, because it fails to indicate whether Babbitt wrote for other instruments besides the synthesizer.

42

The writer wants to link the second paragraph to the ideas that follow. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) helps his listeners understand his musical ideas.
- C) makes his music both funny and persuasive.
- D) makes similar sounding ideas mean different things.

CONTINUE 

[1] *Beaten Paths* refers both to the repetition of musical ideas and the use of the marimba, which is struck to create sound. [2] The pun contained in *Homily* is a bit less obvious. [3] The music of both *Beaten Paths* and *Homily* originate in another work of Babbitt's, *My Complements to Roger*, the title of which contains a pun on the word "compliments"/"complements." [4] A homily is a religious sermon, and a quote from a homily by St. John Chrysostom is included in the score: "And why, it is asked, are there so many snares? That we may not fly low, but seek the things that are above." [5] Other works by Babbitt also contain puns, such as *All Set, About Time*, and *Autobiography of the Eye*. [6] Milton Babbitt, by **43** using percussion instruments in novel ways, enhances listener enjoyment through the creation of different layers of meaning. **44**

43

- A) NO CHANGE
- B) playing around with the meanings of words,
- C) using puns in both the music and titles of his compositions,
- D) having his performers use dynamics and timbre in unusual ways,

44

To make this paragraph most logical, sentence 4 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 2.
- D) after sentence 5.

STOP

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

Math Test - No Calculator
35 Minutes, 30 Questions

For question 1, select the answer that best completes the sentence.

For questions 1-12, select the answer that best completes the sentence.
provided. In the answer choices, the correct answer is indicated by a checkmark.
If the correct answer is not among the choices, select "None of the above."
If the correct answer is "None of the above," select "None of the above."
If the correct answer is "None of the above," select "None of the above."

No Test Material On This Page

1. The area of a square is 16. What is the length of one side?
2. A right triangle has legs of length 3 and 4. What is the length of the hypotenuse?
3. A circle has a radius of 5. What is the area of the circle?
4. A rectangle has a length of 8 and a width of 5. What is the perimeter of the rectangle?





Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

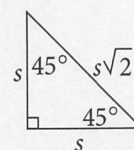
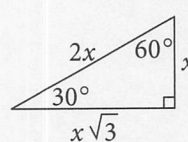
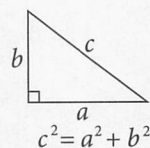
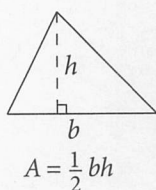
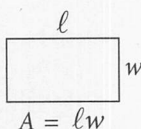
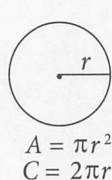
DIRECTIONS

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

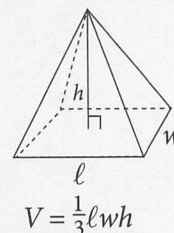
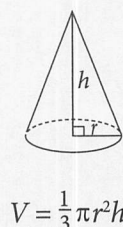
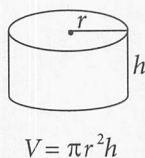
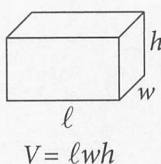
NOTES

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- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- 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



Special Right Triangles



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

Which of the following is equal to $m^{\frac{5}{2}}$, for all values of m ?

- A) $\sqrt{m^5}$
- B) $\sqrt{m^{\frac{1}{5}}}$
- C) $\sqrt[5]{m^2}$
- D) $\sqrt[5]{m^{\frac{1}{2}}}$

2

A sealcoating company will seal d driveways with the same size and shape in a subdivision using a specific type of sealant. The company's fee can be calculated by the expression $dClw$, where d is the number of driveways, C is a constant with units in dollars per square meter, l is the length of each driveway in meters, and w is the width of each driveway in meters. If the homeowners' association asks the company to use a less expensive type of sealant, which of the factors in the expression would change?

- A) l
- B) d
- C) w
- D) C

3

If $4x = 20$, what is the value of $12x - 4$?

- A) 5
- B) 36
- C) 56
- D) 60

4

If $\frac{2}{z} = \frac{8}{z + 42}$, what is the value of $\frac{z}{2}$?

- A) 14
- B) 7
- C) 2
- D) $\frac{1}{7}$

CONTINUE 



5

$$3r - 5s = -17$$

$$5r - 3s = -7$$

If (r, s) is a solution to the system of equations above, what is the value of $r - s$?

- A) 10
- B) -3
- C) -10
- D) -24

6

The number of scripted shows produced for streaming services between 2012 and 2013 is triple the number of scripted shows the services produced between 2009 and 2010. If 24 scripted shows were produced between 2012 and 2013 and s shows were produced between 2009 and 2010, which of the following equations is true?

- A) $3s = 24$
- B) $24s = 3$
- C) $\frac{s}{3} = 24$
- D) $s + 24 = 3$

7

The line $y = cx - 2$, where c is a constant, is graphed in the xy -plane. If the line contains the point (m, n) , where $m \neq 0$ and $n \neq 0$, what is the slope of the line, in terms of m and n ?

- A) $\frac{2 - m}{n}$
- B) $\frac{2 - n}{m}$
- C) $\frac{m + 2}{n}$
- D) $\frac{n + 2}{m}$

8

$$3x - 2y = 5$$

$$cx - 7y = 12$$

In the system of equations above, c is a constant and x and y are variables. For what value of c will the system of equations have no solution?

- A) $-\frac{21}{2}$
- B) $-\frac{36}{5}$
- C) $\frac{36}{5}$
- D) $\frac{21}{2}$



9

x	$p(x)$
0	-1
1	0
2	3
5	4

The function p is defined by a polynomial. Some values of x and $p(x)$ are shown in the table above. Which of the following must be a factor of $p(x)$?

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

10

$$y = a(x - 3)(x + 5)$$

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

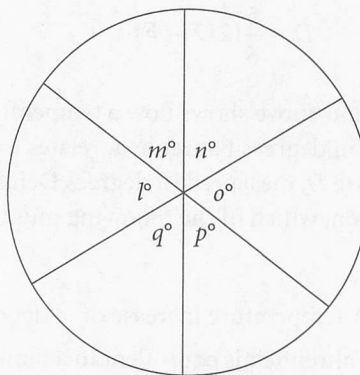
- A) $-2a$
- B) $-10a$
- C) $-15a$
- D) $-16a$

11

In the xy -plane, the parabola with equation $(x - 9)^2$ intersects the line with the equation $y = 36$ at two points, F and G . What is the length of \overline{FG} ?

- A) 10
- B) 12
- C) 15
- D) 25

12



Note: Figure not drawn to scale.

In the figure above, three lines intersect at a point in a circle. If $l + m = n + o$, which of the following statements must be true?

- I. $l = n$
- II. $m = q$
- III. $p = q$

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

CONTINUE



13

What are the solutions to $2x^2 + 12x + 8 = 0$?

- A) $-3 \pm \frac{\sqrt{58}}{2}$
 B) $-3 \pm \sqrt{5}$
 C) $-8 \pm \sqrt{5}$
 D) $-8 \pm 8\sqrt{5}$

14

$$D = \frac{5}{6}(212 - F)$$

The equation above shows how a temperature F , measured in degrees Fahrenheit, relates to the temperature D , measured in degrees Delisle. Based on the equation, which of the following must be true?

- I. A temperature increase of $\frac{5}{6}$ degree Fahrenheit is equivalent to a temperature decrease of 1 degree Delisle.
 II. A temperature increase of 1 degree Delisle is equivalent to a temperature decrease of 1.2 degrees Fahrenheit.
 III. A temperature increase of 1 degree Fahrenheit is equivalent to a temperature decrease of $\frac{5}{6}$ degree Delisle.
- A) II only
 B) III only
 C) II and III only
 D) I, II, and III

15

The equation $\frac{36y^2 + 43y - 25}{ky - 3} = -9y - 4 - \frac{37}{ky - 3}$ is true for all values of $y \neq \frac{3}{k}$, where k is a constant.

What is the value of k ?

- A) 27
 B) 4
 C) -4
 D) -27

CONTINUE

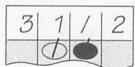


DIRECTIONS

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

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

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 as

$3\frac{1}{2}$.)

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: $\frac{7}{12}$

Write answer in boxes. →

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

← Fraction line

Grid in result. →

Answer: 2.5

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

← Decimal point

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

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

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

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

Answer: 201 – either position is correct

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

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

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

CONTINUE →



16

If $\frac{9}{10}z - \frac{7}{10}z = \frac{1}{3} + \frac{7}{15}$, what is the value of z ?

17

In triangle LMN , the measure of $\angle M$ is 90° ,

$LN = 26$, and $MN = 24$. Triangle OPQ is similar to

triangle LMN , where each side of triangle OPQ is $\frac{1}{5}$

the length of the corresponding side of triangle LMN

and vertices O , P , and Q correspond to vertices L , M ,

and N , respectively. What is the value of $\cos O$?

18

At a bakery, each pecan braid has 30 more milligrams of sodium than each chocolate pastry. If 3 pecan braids and 4 chocolate pastries have a total of 1,840 milligrams of sodium, how many milligrams of sodium does a pecan braid have?

19

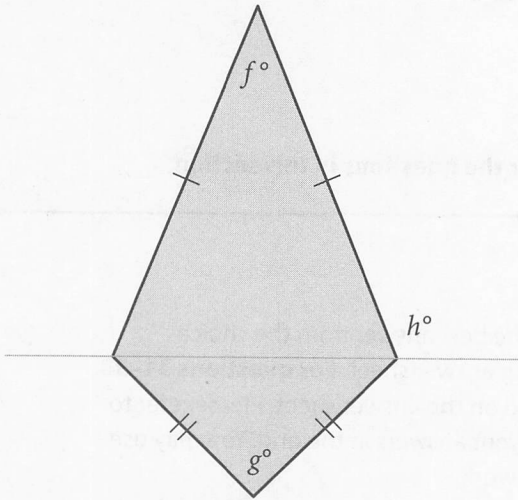
$$a^3(a^2 - 25) = -144a$$

If $a > 0$, what is one possible solution to the equation above?

CONTINUE 



20



Note: Figure not drawn to scale.

Two isosceles triangles are shown above. If $180 - f = 2g$ and $g = 65$, what is the value of h ?

STOP

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



Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

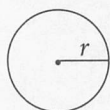
DIRECTIONS

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

NOTES

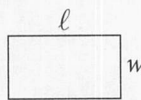
1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
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REFERENCE

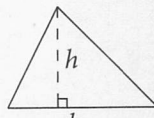


$$A = \pi r^2$$

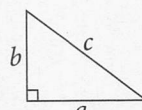
$$C = 2\pi r$$



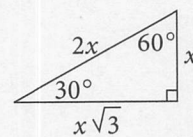
$$A = \ell w$$



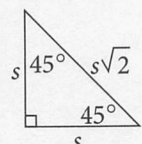
$$A = \frac{1}{2}bh$$



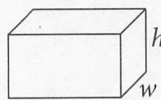
$$c^2 = a^2 + b^2$$



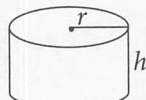
$$x\sqrt{3}$$



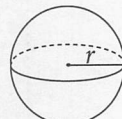
Special Right Triangles



$$V = \ell wh$$



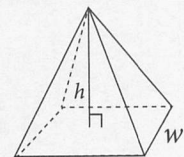
$$V = \pi r^2 h$$



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



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



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

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

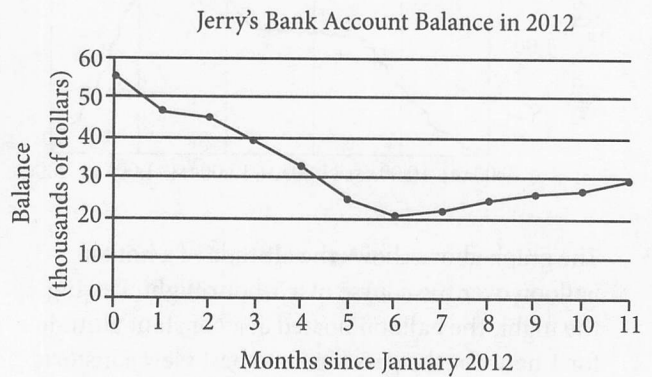
Size	Color		Total
	Red	Blue	
Small	16	6	22
Large	7	21	28
Total	23	27	50

The table above shows the number of marbles of different colors and sizes in a bag of 50 marbles. If a marble is chosen from the bag at random, what is the probability that the marble selected will be either a small red marble or a large blue marble?

- A) $\frac{9}{50}$
- B) $\frac{17}{50}$
- C) $\frac{21}{50}$
- D) $\frac{37}{50}$

2

The graph below shows the balance of Jerry's bank account, in thousands of dollars, for each month from January through December of 2012.



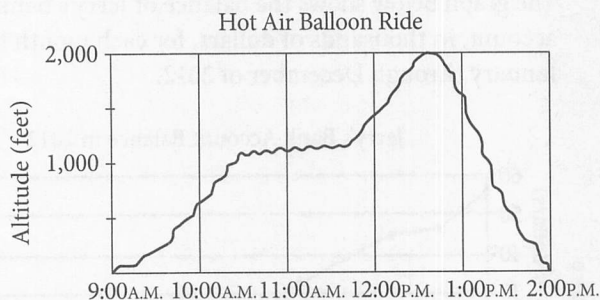
Based on the graph, which of the following best describes the general trend of Jerry's bank account balance in 2012 ?

- A) The balance generally decreased each month in 2012.
- B) The balance generally decreased until July, then increased.
- C) The balance was generally constant throughout 2012.
- D) The balance generally increased each month in 2012.

CONTINUE



3



The graph above shows the altitude of a hot air balloon over the course of a 5-hour flight. During the flight, the balloon floated at a constant altitude for 1 hour for the passengers to best view a historic landmark. Based on the graph, what time did the passengers in the hot air balloon begin viewing the historic landmark?

- A) 10:30 A.M.
- B) 11:30 A.M.
- C) 12:30 P.M.
- D) 1:00 P.M.

4

Every spring, Lowland High School administers a standardized test that includes only math and science questions at various levels of difficulty. On the standardized test, approximately 6 percent of the math questions and 9 percent of the science questions are categorized as very difficult questions. If the test included 153 math questions and 267 science questions, which of the following is the closest to the total number of very difficult questions on this standardized test?

- A) 9
- B) 17
- C) 24
- D) 33

5

What is the sum of $6y^3 - 3y^2 + 7$ and $5y^3 - 2y^2 - 3$?

- A) $11y^6 - 5y^4 + 4$
- B) $11y^6 + 5y^4 + 4$
- C) $11y^3 - 5y^2 + 4$
- D) $11y^3 + 5y^2 + 4$

6

x	$g(x)$
2	-4
3	-2
4	0
5	2
6	4

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

- A) $g(x) = x - 6$
- B) $g(x) = 2x - 8$
- C) $g(x) = 3x - 10$
- D) $g(x) = 4x - 12$

CONTINUE



7

Paul can run 144 meters in 72 seconds. If he runs at this same rate, which of the following is closest to the distance he can run in 16 minutes?

- A) 200 meters
- B) 500 meters
- C) 1,000 meters
- D) 2,000 meters

8

If $\frac{2}{7}z = \frac{5}{2}$, what is the value of z ?

- A) $\frac{35}{4}$
- B) $\frac{5}{7}$
- C) $\frac{4}{35}$
- D) $\frac{7}{5}$

9

Each year, the average number of legal cases per attorney at Gary's law firm can be modeled by the equation $y = 1.74x + 15.3$, where x represents the number of years that Gary's firm has been in operation since it opened in 2000, and y represents the average number of legal cases per attorney. Which of the following best describes the meaning of the number 1.74 in the equation?

- A) The average number of cases per attorney in 2000
- B) The approximate increase in the average number of legal cases per attorney each year
- C) The total number of legal cases that Gary's firm handled in 2000
- D) The approximate difference between the number of legal cases Gary's firm handled in 2000 and in 2005

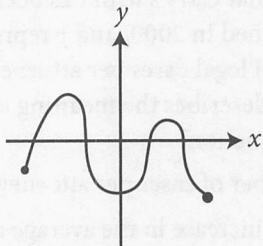
CONTINUE



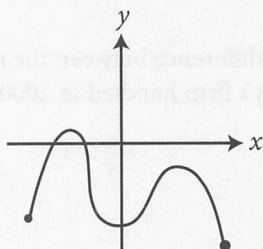
10

The function m has 4 distinct zeros. Which of the following graphs could represent the graph of m in the xy -plane?

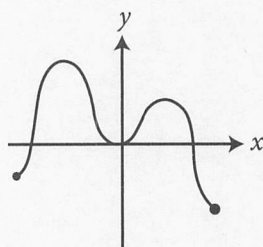
A)



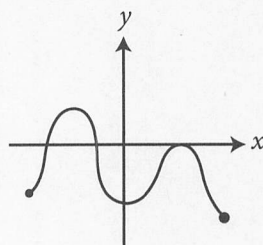
B)



C)



D)



Questions 11 and 12 refer to the following information.

	Spring Constant $\left(\frac{\text{N}}{\text{m}}\right)$
Spring #1	0.7
Spring #2	0.9
Spring #3	1.2
Spring #4	4.7
Spring #5	0.6
Spring #6	3.3
Spring #7	2.1

The chart above shows the spring constants in newtons per meter $\left(\frac{\text{N}}{\text{m}}\right)$ for 7 different springs in a laboratory. The force required to stretch a spring can be found by using the formula $F = km$, where F is the applied force measured in newtons, k is the spring constant measured in $\frac{\text{N}}{\text{m}}$, and m is the distance that the spring is stretched measured in meters.

11

What is the force, in newtons, required to stretch Spring #2 a distance of 5 meters?

- A) 3.5
- B) 4.5
- C) 5.5
- D) 6.5

CONTINUE



12

A force of 7 newtons is applied to stretch Spring #4. Which spring would stretch the same distance when a force of 5 newtons is applied?

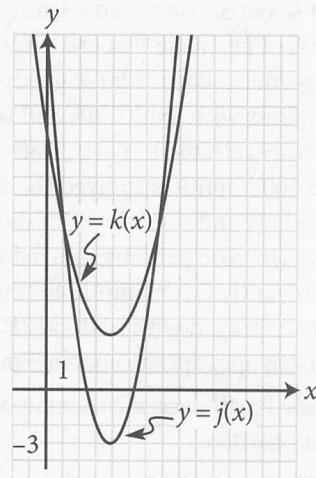
- A) Spring #3
- B) Spring #5
- C) Spring #6
- D) Spring #7

13

A secretarial business bills corporations \$0.30 per minute to type reports. Which of the following equations represents the total bill b , in dollars, for a corporation needing t hours of typing?

- A) $b = \frac{60t}{0.30}$
- B) $b = (0.30)(60)(t)$
- C) $b = 60t + 0.30$
- D) $b = \frac{0.30t}{60}$

14



Graphs of the functions j and k are shown in the xy -plane above. For which of the following values of x does $j(x) + k(x) = 0$?

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

15

$$e = 0.5mv^2 + 10mh$$

The equation above gives the approximate energy e in joules associated with a rollercoaster cart that has mass m in kilograms, speed v in meters per second, and height h in meters. Which of the following gives h in terms of e , m , and v ?

- A) $h = \frac{e}{10m} - 0.05v^2$
- B) $\frac{e - 0.5v^2}{10m}$
- C) $h = e + 0.05v^2 + 1$
- D) $h = \frac{e}{10m} + 0.05v^2$

CONTINUE



16

A group of scientists designed a study to test the effectiveness of pesticide P at eradicating aphids from rose gardens. From a large group of botanists, 400 participants with aphid-infested rose gardens were randomly selected to participate in the study. Half of the 400 botanists sprayed their rose gardens with pesticide P, and the other half did not. The data showed that the rose gardens sprayed with pesticide P had significantly fewer aphids as compared to those that were not sprayed with pesticide P. Which of the following is an appropriate conclusion of the study?

- A) Pesticide P will decrease the number of aphids in any rose garden.
- B) Pesticide P is the best pesticide available for decreasing the number of aphids in a garden.
- C) Pesticide P will likely decrease the number of aphids in aphid-infested rose gardens.
- D) Pesticide P will kill substantial numbers of aphids present in a garden.

Questions 17 and 18 refer to the following information.

$$C(x) = 3x + 75$$

$$R(x) = 8x$$

The cost of manufacturing a product and the revenue generated by that product are functions of the number of products manufactured and sold. The functions above are the cost and revenue functions for a certain product. The function $C(x)$ gives the cost, in dollars, of manufacturing x products and the function $R(x)$ gives the revenue, in dollars, generated when those x products are sold.

17

How many units of product must be manufactured and sold in order for the cost of manufacturing a product to equal the revenue generated by selling the product?

- A) 8
- B) 10
- C) 12
- D) 15

18

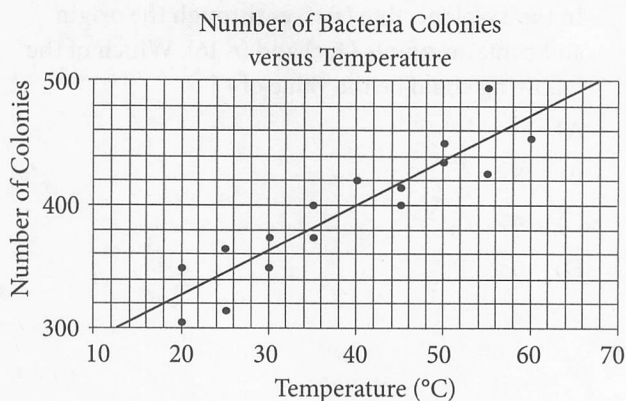
How will the cost of manufacturing change if 5 additional units of product are manufactured?

- A) The cost will decrease by \$15.
- B) The cost will increase by \$3.
- C) The cost will increase by \$15.
- D) The cost will increase by \$75.

CONTINUE



19



Sixteen samples of bacteria were each incubated for 24 hours. The scatterplot above shows the number of colonies present at the end of the incubation period and the temperature of the incubator. The line of best fit for the data is also shown. For the sample incubated at 40°C , the actual number of colonies was about how many more than the number predicted by the line of best fit?

- A) 0
- B) 10
- C) 20
- D) 40

20

Of the following four geographically distinct communities, which community would exhibit exponential growth of the population?

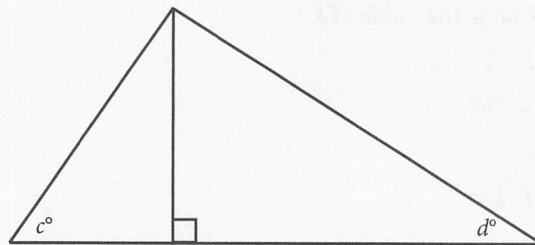
- A) Each successive year, the community increases by 5% of the original population.
- B) Each successive year, the community increases by 4% of the original population and 300 new individuals are added to the community.
- C) Each successive year, 300 new individuals are added to the community.
- D) Each successive year, the community increases by 3% of the current population.

21

Glucose, which is an important component of growth media for cultured cells, is so energy rich that 1 milliliter can feed up to 9 Petri dishes of cells. If a Petri dish has an area of approximately $7\frac{1}{4}$ square centimeters, about how many square centimeters of cells could 115 milliliters of glucose feed?

- A) 140
- B) 1,000
- C) 6,500
- D) 7,500

22



In the triangle shown above, $\sin(c^{\circ}) = \cos(d^{\circ})$. If $c = 6m - 9$ and $d = 8m - 6$, what is the value of m ?

- A) 5.4
- B) 7.5
- C) 10.5
- D) 13.5

CONTINUE



23

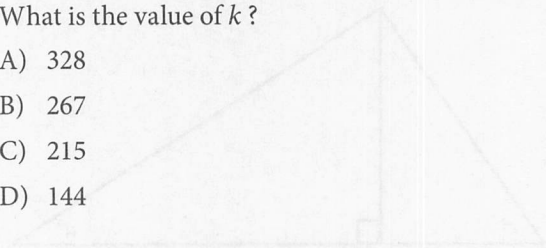
A behavioral biologist has a bag containing t treats that she is using to train a group of animals. If she gives 4 treats to each animal, she will have 6 treats left over. In order to give each animal 5 treats, she will need an additional 8 treats. How many animals are in the behavioral biologist's training group?

- A) 2
- B) 8
- C) 14
- D) 16

24

The sum of three numbers is 738. One of the numbers, k , is 20% less than the sum of the other two numbers. What is the value of k ?

- A) 328
- B) 267
- C) 215
- D) 144



25

In the xy -plane, line l passes through the origin and contains points $(4, r)$ and $(r, 16)$. Which of the following could be the value of r ?

- A) 12
- B) 8
- C) 4
- D) 0

26

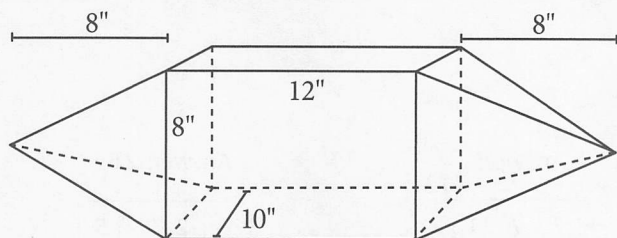
A triangle was modified by increasing its base by 20 percent and decreasing its height by h percent. If these modifications decreased the area of the triangle by 28 percent, what is the value of h ?

- A) 48
- B) 40
- C) 30
- D) 28

CONTINUE



27



A time capsule is constructed from two rectangular pyramids and a rectangular solid with measurements indicated in the figure above. Of the following, which is the closest to the volume of the time capsule, in cubic inches?

- A) 1,386
- B) 1,173
- C) 960
- D) 426

28

$$2a + x = 4a - 8$$

$$2b + y = 4b - 8$$

In the equation above, x and y are constants. If x is

y minus $\frac{1}{4}$, which of the following is true?

- A) a is b minus $\frac{1}{2}$
- B) a is b minus $\frac{1}{4}$
- C) a is b minus $\frac{1}{8}$
- D) a is b plus $\frac{1}{4}$

29

In order to plan for his family's future, Michael has decided to invest some of his money into a mutual fund that, starting from the present, his broker estimates will increase by 15 percent every 4 years. If Michael invests \$20,000 into the mutual fund, which of the following expressions represents his broker's estimate of his mutual fund's worth t years from now?

- A) $20,000(1.15)^{\frac{t}{4}}$
- B) $20,000(0.15)^{\frac{t}{4}}$
- C) $20,000(1.15)^{4t}$
- D) $20,000(0.15)^{4t}$

30

	Varsity Soccer	Varsity Basketball
Juniors		
Seniors		
Total	108	32

The unfinished table above shows the number of juniors and seniors at Woodsfield High School who participate in either varsity soccer or varsity basketball. There are 4 times as many varsity soccer players who are juniors as there are varsity basketball players who are juniors, and there are 3 times as many varsity soccer players who are seniors as there are varsity basketball players who are seniors. If there is a total of 108 varsity soccer players and 32 varsity basketball players at Woodsfield High, which of the following is closest to the probability that a randomly chosen varsity basketball player is a junior? (Note: Assume that no student plays both varsity soccer and varsity basketball.)

- A) 0.086
- B) 0.134
- C) 0.247
- D) 0.375

CONTINUE

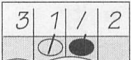


DIRECTIONS

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

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

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

as 3.5 or 7/2. (If  is entered into

the grid, it will be interpreted as $\frac{31}{2}$, not as

$3\frac{1}{2}$.)

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

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

Write answer in boxes. →

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

Grid in result. →

Fraction line ←

Answer: 2.5

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

Decimal point ←

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

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

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

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

Answer: 201 – either position is correct

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

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

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

CONTINUE →



31

Enrollment per Course at Riverview College—
Spring Semester of 2001

Course	Number of Students Enrolled	Course	Number of Students Enrolled
Sociology	98	U.S. History	27
Psychology	37	Anthropology	33
Economics	85	Marketing	68
Calculus	45	Political Science	79
Biology	42	Linguistics	16
Accounting	64	Chemistry	52

The above table lists the number of students enrolled in 12 different courses at Riverview College during its spring semester of 2001. According to the table, what is the mean class size of these selected courses at Riverview College in the spring semester of 2001? (Round your answer to the nearest tenth.)

32

A fruit stand sells pints of blueberries for \$3 each and pints of strawberries for \$5 each. If John spends at least \$23 but no more than \$27 on b pints of blueberries and 1 pint of strawberries, what is one possible value of b ?

33

Jasmine's algebra teacher gives pop quizzes that are scored between 0 and 50 points, inclusive. After the first 5 quizzes, Jasmine's quiz average (arithmetic mean) is 35. What is the lowest score Jasmine can receive on the 6th quiz and still be able to have an average of at least 45 for the first 20 quizzes?

34

$$(-4z^2 + 3z - 7) - 3(z^2 - 5z - 2)$$

If the expression above is rewritten in the form $az^2 + bz + c$, where a , b , and c are constants, what is the value of b ?



35

$$y \geq -12x + 384$$

$$y \geq 4x$$

In the xy -plane, if a point with coordinates (f, g) lies in the solution set of the system of inequalities above, what is the minimum value of g ?

36

In a circle with center C , central angle XCY has a measure of $\frac{3\pi}{2}$ radians. The major arc XY formed by central angle XCY is what fraction of the circumference of the circle?

Questions 37 and 38 refer to the following information.

In telecommunication networks, the transmission time is the amount of time required for a message to be successfully transmitted from beginning to end. If a message is transmitted at a rate of r bytes per second with a transmission time of T seconds, then the size of the message in b bytes can be found by the formula $b = rT$.

The CEO of Relay Communications estimates that the average global transmission time of a message is 2.5 seconds and that the average transmission rate is 1,000 bytes per second. The CEO uses the above formula to estimate that the average global message size at his company is 2,500 bytes.

37

The CEO of Relay Communications decides to study transmission times in a rural geographical region that his company serves. In this region, the CEO estimates that the average transmission rate rises to 75,000 bytes per minute and that the average transmission time is 1.6 seconds. The average message size in this region is what percent less than the average global message size? (Note: Ignore the percent symbol when entering your answer. For example, if the answer is 24.1%, enter 24.1.)



38

Transmission times can vary depending on population, geographical region, or the type of material used in the telecommunication wires. The CEO realizes that in a heavily populated city, the transmission rate drops to 45,000 bytes per minute. If the average transmission time of a message being transmitted in this heavily populated city is 4.2 seconds, what is the average size of a message transmitted by Relay Communications in this heavily populated city?

END OF TEST**DO NOT RETURN TO A PREVIOUS SECTION.**