Practice Test 6
Questions 1-10 are based on the following passage.

This passage is an excerpt from the novel The Thirty-Nine Steps by John Buchan, copyright © 1915.

I sat down in an armchair and felt very sick. That lasted for maybe five minutes, and was succeeded by a fit of the horrors. The poor staring white face on the floor was more than I could bear, and I managed to get a tablecloth and cover it. Then I staggered to a cupboard, found the brandy and swallowed several mouthfuls. I had seen men die violently before; indeed I had killed a few myself in the Matabele War; but this cold-blooded indoor business was different. Still I managed to pull myself together. I looked at my watch, and saw that it was half past ten.

An idea seized me, and I went over the flat with a small-tooth comb. There was nobody there, nor any trace of anybody, but I shuttered and bolted all the windows and put the chain on the door. By this time my wits were coming back to me, and I could think again. It took me about an hour to figure the thing out, and I did not hurry, for, unless the murderer came back, I had till about six o’clock in the morning for my cogitations.

I was in the soup—that was pretty clear. Any shadow of a doubt I might have had about the truth of Scudder’s tale was now gone. The proof of it was lying under the table-cloth. The men who knew that he knew what he knew had found him, and had taken the best way to make certain of his silence. Yes; but he had been in my rooms four days, and his enemies must have reckoned that he had confided in me. So I would be the next to go. It might be that very night, or the next day, or the day after, but my number was up all right. Then suddenly I thought of another probability. Supposing I went out now and called in the police, or went to bed and let Paddock find the body and call them in the morning. What kind of a story was I to tell about Scudder? I had lied to Paddock about him, and the whole thing looked desperately fishy. If I made a clean breast of it and told the police everything he had told me, they would simply laugh at me. The odds were a thousand to one that I would be charged with the murder, and the circumstantial evidence was strong enough to hang me. Few people knew me in England; I had no real pal who could come forward and swear to my character. Perhaps that was what those secret enemies were playing for. They were clever enough for anything, and an English prison was as good a way of getting rid of me till after June 15th as a knife in my chest.

Besides, if I told the whole story, and by any miracle was believed, I would be playing their game.

Karolides would stay at home, which was what they wanted. Somehow or other the sight of Scudder’s dead face had made me a passionate believer in his scheme. He was gone, but he had taken me into his confidence, and I was pretty well bound to carry on his work.

You may think this ridiculous for a man in danger of his life, but that was the way I looked at it. I am an ordinary sort of fellow, not braver than other people, but I hate to see a good man downed, and that long knife would not be the end of Scudder if I could play the game in his place.
It took me an hour or two to think this out, and by that time I had come to a decision. I must vanish somehow, and keep vanished till the end of the second week in June.

Over the course of the passage, the narrator’s attitude shifts from one of shock to
A) disbelief.
B) engagement.
C) condolence.
D) despair.

Which choice provides the best evidence for the answer to the previous question?
A) Lines 29-31 (“It might . . . all right”)
B) Lines 36-38 (“If I . . . me”)
C) Lines 38-41 (“The odds . . . hang me”)
D) Lines 53-54 (“He was . . . his work”)

The most likely reason the narrator goes “over the flat with a small-tooth comb” is to
A) look for evidence to help determine the identity of the attacker.
B) make sure that the attacker was not still in the flat.
C) collect the belongings that he needs before vanishing.
D) see if there are any more victims he has not yet noticed.

As used in line 20, “cogitations” most nearly means
A) compassions.
B) recognitions.
C) meditations.
D) senses.

As used in line 21, “in the soup” most nearly means
A) in the kitchen.
B) lost in a fog.
C) in a predicament.
D) in an intoxicated state.

The narrator indicates that he is unable to tell the police about Scudder’s story and death because
A) it is likely that the police would accuse him of murdering Scudder.
B) because the police would think it is all just a big joke.
C) because the police would see that he was just playing Scudder’s killers’ game.
D) because the narrator is not a particularly brave man.

Which choice provides the best evidence for the answer to the previous question?
A) Line 1 (“I sat . . . sick”)
B) Lines 38-41 (“The odds . . . hang me”)
C) Lines 48-49 (“Besides, if . . . game”)
D) Lines 56-60 (“I am . . . place”)

The sentence in lines 28-29 (“So I would be the next to go”) most nearly implies that
A) the narrator is likely going to be killed soon as well.
B) the narrator would likely go to prison for murder.
C) the narrator needs to leave the house to call the police.
D) it is the narrator’s turn to tell a story.
9 The question the narrator asks in lines 34-35, ("What kind of a story was I to tell about Scudder?") mainly serves to
A) demonstrate that the author cannot tell the true story of who Scudder was and how he died.
B) indicate that the author really doesn't know much about Scudder at all.
C) begin a conversation with the narrator's roommate as to who Scudder is and how long he will stay.
D) encourage the reader to construct the story that should be told of Scudder.

10 As used in line 53, “confidence” most nearly means
A) certainty.
B) poise.
C) assurance.
D) trust.
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Questions 11-21 are based on the following passage and supplementary material.

The following passage is an excerpt from History of the USA since World War I by N. Sivachyov and E. Yazkov, © 1976.

In early March 1933, at the moment of Franklin Delano Roosevelt’s inauguration, the economic and political situation in the country was extremely tense. On the heels of a new intensification of the industrial and agricultural crisis came the complete collapse of the banking system, which in effect ceased functioning. The banking catastrophe which occurred in February and March of that year paralyzed the US economy and entailed the mass ruination of small depositors. Millions of working people were now directly confronted with the threat of starvation and death.

The American people, who had already borne the burden of the financial crisis for several years now, were no longer in a mood to tolerate a do-nothing government. The industrial workers and farmers were increasingly vociferous in their demands for decisive relief measures. Dissatisfaction and indignation were growing from day to day.

In these days, critical for the American bourgeoisie, the ruling financial elite in the USA, fearing for its position of class dominance, was forced to alter the direction of the ship of state, the more so because the inappropriateness of Hoover’s philosophy of “rugged individualism” was now evident to all. The elite was forced to agree to a more flexible policy and to the promulgation of a number of liberal reforms. The new, 32nd President of the United States, Franklin D. Roosevelt, was the moving force behind these reforms and went down in history as one of the most important, far-seeing, and realistic of American political figures.

As soon as it took up the reins of power, the Roosevelt government set in motion an entire complex of extraordinary measures. On March 9, 1933 it summoned a special session of Congress, which worked for three months to adopt a multitude of laws encompassing nearly all aspects of the country’s economic and political life. In this space of the “first hundred days” of the Roosevelt Administration the policy known as the New Deal took its basic shape.

The theoretical underpinnings of the New Deal were found in the thought of the English economist John Maynard Keynes, a proponent of state-monopoly capitalism. Reflecting the profound changes accruing in the economies of the capitalist countries during the era of the general crisis of capitalism, Keynes and his followers argued that capitalism was no longer a self-regulating system and that energetic government regulation was required to ensure the normal course of capitalist reproduction. In conformity with these general theoretical propositions put forth by the Keynesians, the New Deal government set as its fundamental socio-economic task the restoration of the economy and salvation of the threatened US ruling class through active government intervention in the process of capitalist reproduction and through systematic government regulation of the economy. The commencement of the New Deal marked the transformation of state-monopoly capitalism, which had begun during World War I, into a constant factor in US economic life.

The political mission of Roosevelt’s New Deal consisted of using the methods of social maneuver to blunt the mass workers’ and farmers’ movement that rolled over the country during the crisis period of 1929-1933. This explains why the cardinal points of the New Deal, calculated primarily to consolidate monopoly dominance in industry and agriculture, included some concessions to the working people and certain liberal reforms somewhat extending the rights of workers and farmers.

The New Deal signified a major break from the ideology of reactionary individualism and from the principles of classical liberalism with its doctrine of free trade and governmental non-interference in the economy. Instead, the ideology of neo-liberalism was adopted, implying active government interference in private property relations with the aim of shoring up the eroded socio-economic foundations of capitalist society through improvements in the social structure and liquidation of the most noxious cancers in the body of society.
Figure 1

U.S. Economy before New Deal
% national income

- Federal Government Sector
- State & Local Government Sector
- Private Sector

Figure 2

Unemployment Rate for Non-Farm Workers, 1926–1947

- Stock market crash
- FDR's first New Deal
- Supreme Court declares much of New Deal unconstitutional
- New Deal, Part 2 begins
- World War II begins
- U.S. creates “war economy”
- U.S. enters WWII
- 5.5%—Normal unemployment rate, 1970–2008
- WWII ends

Figure 2

CONTINUE
Which choice best summarizes the first paragraph of the passage (lines 1-11)?

A) Franklin Delano Roosevelt was elected in reaction to the banking crisis known as the Great Depression.

B) The majority of the American public was unable to earn enough money to put food on the table.

C) The depressed American economy caused widespread poverty in the nation.

D) The Great Depression began in March of 1933.

According to the passage, the Americans who had suffered most during the previous years of economic depression could best be described as

A) resilient.

B) indulgent.

C) empathetic.

D) uncompromising.

In line 35, “special” most nearly means

A) singular.

B) extraordinary.

C) selective.

D) unscheduled.

The passage implies that Franklin Delano Roosevelt

A) singlehandedly saved the nation from financial ruin.

B) intended to limit the power of the ruling class of the American financial elite.

C) was a student of English economist John Maynard Keynes.

D) was a remarkable forward-thinking and pragmatic leader.

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

A) Lines 19-24 (“In these . . . all”)

B) Lines 26-31 (“The new . . . figures”)

C) Lines 32-34 (“As soon . . . measures”)

D) Lines 41-44 (“The theoretical . . . capitalism”)

In line 66, “cardinal” most nearly means

A) principal.

B) directional.

C) sacred.

D) reliable.

According to the passage, prior to the New Deal how did the American economy primarily function?

A) As a wealthy 1% class and a poorer 99% class split

B) As a noninterventionist system with limited government restriction

C) As one based primarily on agriculture and farming

D) As one actively managed by local, state, and federal governments

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

A) Lines 58-61 (“The commencement . . . life”)

B) Lines 66-71 (“This explains . . . farmers”)

C) Lines 72-76 (“The New . . . economy”)

D) Lines 76-82 (“Instead, the . . . society”)
The author of the passage would most likely consider the information in Figure 1 to be
A) support for his argument that since the implementation of the New Deal there was greater government control of the economy.
B) support for his argument that the New Deal not only saved but also increased the production of the private sector.
C) indicative of the dangers of allowing too much government control over an economy.
D) proof that the private sector of the U.S. economy was likely to shrink regardless of heightened government regulation.

According to Figure 2, which of the following is true?
A) The Supreme Court declaring that the New Deal was partly unconstitutional directly increased the non-farm workers’ unemployment rate.
B) The New Deal showed greater success in its first phase than in subsequent implementations.
C) The postwar non-farm workers’ unemployment rate in 1946 and 1947 was the lowest it had ever been since the stock market crash.
D) A “war economy” has a negative effect on unemployment and national financial security.

Figure 2 suggests which of the following about the initial implementation of the New Deal?
A) The non-farm workers’ unemployment rate would have increased at the same rate since 1929 without it.
B) It was as effective at lowering the non-farm workers’ unemployment rate as entering World War II was.
C) It had a beneficial effect by quickly lowering the non-farm workers’ unemployment rate for several consecutive years.
D) It directly caused the reduction of non-farm workers’ unemployment to the same level experienced prior to the stock market crash.
Questions 22-31 are based on the following passage.

Passage 1

The word “creativity” was made up less than a hundred years ago. It is time to stop using it.

People living in the twentieth century heard a lot of talk about “creativity.” People living in the twenty-first century will not. Creativity is not dead yet, but its end is in sight. Alfred North Whitehead invented the word in 1926. 75 years later, it was one in every 70,000 words published and had become the name of a popular hypothesis: that new things are created by “geniuses” who solve problems by deliberately not thinking about them—a step called “incubation”—until they receive answers in sudden, dramatic moments of “insight.” One of the most frequently cited examples is attributed to Mozart:

“When I am, as it were, completely myself, and of good cheer, my ideas flow best and most abundantly. My subject stands almost complete in my mind. When I write down my ideas everything is already finished; and it rarely differs from what was in my imagination.”

These words, which I have edited for length, first appeared in a letter to Germany’s General Music Journal in 1815, then in many other places, including Jacques Hadamard’s 1945 The Mathematician’s Mind: Creativity, edited by Philip Vernon in 1976; and Roger Penrose’s 1989 The Emperor’s New Mind. They remain popular: in 2015, they have already appeared in at least one book and one journal.

But Mozart did not write them, they do not describe how he composed, and we have known this since 1856, when Mozart biographer Otto Jahn showed that they were forged.

Why do so many people writing about creativity keep citing them as if they were true? Because there is little else to cite. Psychologists have been trying to prove the creativity hypothesis for nearly a hundred years. Their results are, at best, mixed.

Passage 2

Scientific theories are essentially models of the real world (or parts thereof), and a lot of the vocabulary of science concerns the models rather than the reality. For example, scientists often use the word “discovery” to refer to some purely theoretical advance. Thus one often hears it said that Stephen Hawking “discovered” that black holes are not black, but emit heat radiation. This statement refers solely to a mathematical investigation. Nobody has yet seen a black hole, much less detected any heat radiation from one.

The relationship between a scientific model and the real system it purports to represent raises some deep issues. To illustrate the problem, we start with something fairly straightforward. In the sixteenth and seventeenth centuries the work of Copernicus, Kepler, Galileo and Newton overturned centuries of entrenched ecclesiastical beliefs about the position of the Earth within the Universe. Galileo was persecuted at the hands of the church because he concurred with the Copernican notion that the Earth moves around the Sun. This idea conflicted with the then current theological interpretation of biblical cosmology, which places the Earth at the center of creation.

It is a curious fact, however, that the church authorities did not object to the concept of a moving Earth as such, so long as it was only used as a model to compute the motions of heavenly bodies. What they found intolerable was Galileo’s claim that the Earth really moves. But this raises an intriguing question.

How is one to know when a scientific model is merely a computational device and when it describes reality?

Science began as an extension of common sense, refined and systematized to a high degree: so when scientists began to build theories they usually started by taking the world at face value. Thus, when ancient astronomers tracked the motion of the stars across the sky, they naturally devised a model of the Universe in which the Earth was located at the center of a collection of revolving spheres carrying the Sun, Moon, stars and planets. As observations became increasingly accurate, this model had to be adapted and readapted to include many spheres, and spheres within spheres. This system of epicycles grew more and more complicated. When Copernicus placed the Sun at the center, the heavenly motions immediately became far simpler to model.

Today, no scientist doubts that the Sun is really at the center of the Solar System, and that it is the Earth which revolves, not the sky. But is this certainty based merely on Occam’s razor—on the fact that the heliocentric model is simpler than the geocentric model? Surely there must be more to it than that?
The author’s attitude towards the word “creativity” (line 1) is
A) nostalgic.
B) bemused.
C) jaded.
D) antiquated.

Which choice provides the best evidence for the answer to the previous question?
A) Line 2 (“It is time . . . using it”)
B) Lines 5-6 (“Creativity . . . sight”)
C) Lines 7-8 (“75 years . . . hypothesis”)
D) Lines 12-13 (“One of . . . Mozart”)

The primary purpose of the second paragraph (lines 3-13) is
A) to show the increase in the use of a word.
B) to show how the word has become important in some circles.
C) to introduce an idea later refuted by the author.
D) to support a previous statement.

What is the meaning of the word “mixed” (line 35) in context?
A) Misunderstood
B) Stirred
C) Scientific
D) Varied

The quotes around the word “discovery” (line 39) are meant to
A) note the misuse of the word.
B) show the importance of the word.
C) draw attention to an important concept.
D) provide an alternate meaning.

As used in line 51, “overturned” most nearly means
A) flipped over.
B) shown to be false.
C) ancient.
D) revolted.

Seventeenth-century church authorities believed that the concept of a moving Earth as presented by Galileo was
A) entirely false and objectionable.
B) only acceptable when viewed as a theoretical concept.
C) heresy, punishable by excommunication and death.
D) correctly calculated and appropriate for describing the motion of the heavenly bodies.

According to the authors of both passages, which of the following pairs have the most similar attitudes?
A) Ashton and Kepler
B) Psychologists and scientists
C) Mozart and Newton
D) People who quote Mozart and “church authorities”
30 Which choice provides the best evidence for the answer to the previous question?
A) Lines 1-2 (“The word . . . ago”) and lines 37-38 (“the vocabulary . . . reality”)
B) Lines 24-26 (“They remain . . . journal”) and lines 50-53 (“the work . . . Universe”)
C) Lines 28-30 (“and we . . . forged”) and lines 59-61 (“It is a . . . Earth”)
D) Lines 33-35 (“psychologists . . . years”) and lines 82-83 (“no scientist . . . System”)

31 The scientific model is most analogous to
A) the universe.
B) the creativity hypothesis.
C) *The Mathematician’s Mind; Creativity.*
D) black holes.
Questions 32-42 are based on the following passage.

The following is an excerpt from “Satellite Tracking and Geospatial Analysis of Feral Swine and Their Habitat Use in Louisiana and Mississippi.” Copyright © 2012 by U.S. Geological Survey.

Feral swine (Sus scrofa) is an invasive species that was first introduced to the continental United States in the 1500s by European explorers. Also known as feral hogs or feral pigs, the animals typically weigh about 200 pounds (up to 400 pounds), have characteristic tusks up to 3 inches long, are territorial, and live in groups, except for the boars, who are solitary and typically interact with sows only to breed. They have an average litter size of 5–6 piglets and occasionally two litters per year, and because they have few natural predators, survival of their young can be nearly 100 percent.

Feral swine root, or dig, for food and create wallows, thereby destroying sensitive vegetation, displacing native wildlife, and ultimately leading to loss of habitat quality and value. In coastal wetlands, their rooting decreases underground production and expansion of the root zone, exacerbating coastal erosion and land loss. Rooting activities in forested habitats impact forest regeneration and vegetation structure and may lead to increases in invasive plants, including Chinese tallow tree (Triadica sebifera) and cogon grass (Imperata cylindrical). Hurricane protection levees and other water control structures that protect human communities have been severely damaged by rooting. In agricultural lands, feral swine consume crops, damage crop fields, prey on livestock, and create potentially hazardous conditions for the operation of farm equipment. Feral swine compete for food directly with many native animals—such as ducks, deer, squirrels, turkeys, and bears—and destroy habitats for many other wildlife species, including ground-nesting birds. Their omnivorous diet includes ground-nesting birds and eggs, reptiles, and amphibians. Further, feral swine are known to spread more than 30 diseases and 37 parasites, including swine brucellosis and pseudorabies, which can have devastating effects on livestock, wildlife, and humans. Because of the detrimental impacts of this invasive species, many public lands implement feral swine control programs on an annual basis. In Louisiana, several wildlife refuges allow swine trapping by permitted individuals and hunting by licensed individuals. This activity is not enough to control or prevent an increase in swine populations, however, because of their distribution beyond the boundaries of public lands.

Currently, little is known about feral swine populations, their habitat use and movement patterns, and the resulting habitat destruction in Louisiana and Mississippi. To abate this lack of knowledge, researchers at the U.S. Geological Survey (USGS) National Wetlands Research Center (NWRC)—in cooperation with the U.S. Fish and Wildlife Service, the Louisiana Department of Wildlife and Fisheries, and several large landholding companies—are using collars equipped with Global Positioning System (GPS) receivers to track feral swine in Louisiana and Mississippi to examine population movement patterns, document destruction of habitat and wildlife, and help increase and facilitate removal—the preferred control measure for feral swine populations. The NWRC researchers are using the “Judas pig” system of attaching GPS-satellite telemetry collars to select feral swine to (1) track movement patterns on the landscape, (2) document habitat destruction and effects on native wildlife, and (3) improve removal rates. Once a collar has been attached to an individual, usually a large boar or sow, it is released and returns to its group. The group’s movements and locations can then be tracked through the movement of the collared individual, the “Judas pig,” allowing researchers and managers to better target removal efforts.

The use of GPS telemetry will allow the NWRC researchers to monitor feral swine movements daily. The results of this research will provide natural resource managers with more information for managing and responding to the impacts of this invasive species.
The primary purpose of the passage is to
A) describe an innovative way to use technology for animal research.
B) explore the bio-ethics of controlling an animal population.
C) educate the reader about the feral hog and the steps being taken to control its population.
D) provide a detailed history of the feral swine in the central-southern United States.

The author’s attitude toward feral swine is best described as one of
A) academic interest.
B) personal concern.
C) natural outrage.
D) subtle fondness.

According to the passage, which of the following is true?
A) Feral swine populations move as a nuclear family of boar, sow, and offspring.
B) Feral swine are indigenous to the central-southern area of the United States.
C) We have a limited working knowledge of how feral swine populations navigate the environment.
D) Consuming pig meat that carries diseases can have a devastating effect for the human population.

Which choice provides the best evidence for the answer to the previous question?
A) Lines 3-8 (“Also known . . . breed”)
B) Lines 16-19 (“In coastal . . . loss”)
C) Lines 35-38 (“Further, feral . . . humans”)
D) Lines 48-51 (“Currently, little . . . Mississippi”)

The phrase “survival of their young can be nearly 100 percent” (lines 11-12) most directly suggests that
A) The feral pig population is maintained at a constant rate.
B) The feral pig did not thrive until coming to the United States.
C) The feral pig population can grow quite large.
D) The work put into maintaining the feral pig population has been successful.

As used in line 14, “wallows” most nearly means
A) hills.
B) miseries.
C) stumbles.
D) depressions.

What does the author suggest is a negative way feral hog populations affect human communities?
A) Feral hogs cause damage to farm equipment while it is stored.
B) Feral hogs destroy the natural habitats of a variety of other animals.
C) Feral hogs do not stay on public land, decreasing the ability to hunt them.
D) Feral hogs can destroy protective structures such as levees.

Which choice provides the best evidence for the answer to the previous question?
A) Lines 23-26 (“Hurricane protection . . . rooting”)
B) Lines 26-29 (“In agricultural . . . equipment”)
C) Lines 29-33 (“Feral swine . . . birds”)
D) Lines 44-47 (“This activity . . . lands”)
40
As used in line 42, “refuges” most nearly means
A) evacuees.
B) sanctuaries.
C) exiles.
D) safeties.

41
Which of the following does the author suggest about the GPS collars mentioned in lines 62-73 (“The NWRC researchers . . . target removal efforts”)?
A) One collar on a single pig may provide information on an entire group’s movements.
B) The ethical use of collars has been debated by the scientific community.
C) Hunters know to release trapped pigs that have a collar rather than kill them.
D) Scientists try to collar younger pigs in order to learn about both pig movement and life cycle.

42
The most likely purpose of the use of quotations around the term “Judas pig” in lines 63 and 72 is
A) to demonstrate personification.
B) to indicate an allusion.
C) to establish irony.
D) to clarify a metaphor.
Questions 43-52 are based on the following passage and supplementary material.

The following passage is from USGS Mineral Resources Program report “Nickel—Makes Stainless Steel Strong.” Copyright © 2012 by U.S. Geological Survey.

Nickel is a silvery-white metal that is used mainly to make stainless steel and other alloys stronger and better able to withstand extreme temperatures and corrosive environments. Nickel was first identified as a unique element in 1751 by Baron Axel Fredrik Cronstedt, a Swedish mineralogist and chemist. He originally called the element kupfernickle because it was found in rock that looked like copper (kupfer) ore and because miners thought that “bad spirits” (nickel) in the rock were making it difficult for them to extract copper from it.

Nickel is the fifth most abundant element in the Earth, but most of that nickel is located in the core, more than 1,800 miles below the surface. In Earth's crust, two major types of ore deposits supply most of the nickel used today: magmatic sulfide deposits and laterite deposits. Also, manganese nodules and crusts on the deep sea floor may contain as much nickel as the deposits known onshore, but they are not currently being mined. Magmatic sulfide deposits contain about 40 percent of global nickel resources and currently are the source of more than one-half of the world's nickel supply. Nickel deposits may develop if magma that contains low amounts of silica and high amounts of magnesium becomes saturated in sulfur, usually through reacting with rocks in Earth's crust.

A sulfur-rich liquid may separate from the magma; ions of nickel, and some other elements, may move into it. Because the sulfur-rich liquid is denser than the magma, the liquid sinks and accumulates along the base of magma chambers, intrusions, or lava flows, where nickel-bearing sulfide minerals may then crystallize. The sulfide minerals often contain cobalt, copper, or platinum-group metals as well. The Sudbury Igneous Complex is Canada's leading source of nickel and the second largest nickel sulfide deposit in the world. The complex is unique because it was formed when an extraterrestrial body, likely a comet, hit Earth about 1,850 million years ago. Parts of Earth's crust near the impact melted and formed a large layer of magma in the resulting crater; nickel-bearing sulfide liquid collected along the base of the magma layer, and nickel- and copper-bearing sulfide minerals crystallized from it.

Laterite deposits host approximately 60 percent of the world's nickel resources. Laterite deposits form in warm, humid, tropical or subtropical environments when igneous rocks with low amounts of silica and high amounts of magnesium are broken down by chemical weathering. Weathering removes some of the original rock components, creating residual deposits where elements such as nickel may be concentrated.

Approximately 80 percent of the primary (not recycled) nickel consumed in the United States in 2011 was used in alloys, such as stainless steel and superalloys. Because nickel increases an alloy's resistance to corrosion and its ability to withstand extreme temperatures, equipment and parts made of nickel-bearing alloys are often used in harsh environments, such as those in chemical plants, petroleum refineries, jet engines, power generation facilities, and offshore installations. All U.S. circulating coins except the penny are made of alloys that contain nickel. Nickel alloys are increasingly being used in making rechargeable batteries for portable computers, power tools, and hybrid and electric vehicles. Nickel is also plated onto such items as bathroom fixtures to reduce corrosion and provide an attractive finish.

There were no active nickel mines in the United States in 2011, although small amounts of nickel were recovered as a byproduct from processing copper and palladium-platinum ores. Recycled nickel accounted for approximately 43 percent of U.S. nickel consumption in 2011. Russia was the leading producer of nickel in 2011, followed by Indonesia, the Philippines, and Canada. From 2007 through 2010, Canada supplied approximately 38 percent of U.S. nickel imports followed by, in order of the amount imported, Russia (17 percent), Australia, Norway, and other countries. The bulk of the world's known nickel reserves are concentrated in Australia, Brazil, Canada, Cuba, New Caledonia, and Russia.

The United States relies on imports and recycling for its supplies of nickel, and this situation is unlikely to change significantly for at least the next 25 years. The risk of a disruption in supply is low, however, because there are sufficient global reserves, spread across more than 10 countries, to meet projected demand for nickel for many years to come. The U.S. Government no longer holds nickel in the National Defense Stockpile. Production from laterite deposits is likely to increase as the nickel resources in existing sulfide mines are depleted.
43 The main purpose of the passage is to
A) provide the reader with an overview of the formation and uses of a commonly used metal.
B) review the various applications of a multifaceted metal.
C) describe the common health risks that are associated with a naturally occurring element.
D) illustrate the strength of the Russian mining economy.

44 Over the course of the passage, the focus shifts from
A) the etymology of the name nickel to the general naming conventions of elements and metals.
B) the discovery and formation of nickel to its uses and current production.
C) the individual who discovered nickel to the country that consumes the most nickel.
D) the natural locations of nickel to the reason it's so commonly used.

45 Where does the author indicate the majority of the Earth's total nickel supply is located?
A) Earth's core
B) The Sudbury Igneous Complex
C) Magmatic sulfide deposits
D) The United States

46 Which choice provides the best evidence for the previous question?
A) Lines 11-13 ("Nickel is . . . surface")
B) Lines 19-22 ("Magmatic sulfide . . . supply")
C) Lines 33-36 ("The Sudbury . . . world")
D) Lines 52-55 ("Approximately 80 . . . superalloys")

47 The author's use of the phrase "likely a comet" (line 37) implies that
A) it is likely that other nickel deposits occurred at the sites of other comet strikes.
B) asteroids are unable to cause the formation of nickel deposits.
C) it is unknown what exactly caused the formation of the Sudbury Igneous Complex.
D) there is physical evidence that a comet caused the formation of the Sudbury Igneous Complex.

48 As used in line 44, "host" most nearly means
A) entertain.
B) crowd.
C) present.
D) hold.
The primary rhetorical effect of the author’s mention of “chemical plants, petroleum refineries, jet engines, power generation facilities, and offshore installations” (lines 59-61) is to
A) use specifics to strengthen an otherwise general argument.
B) give the reader a sense of how harsh certain environments can be.
C) counterbalance the positivity of nickel’s use in green technologies.
D) convince readers that nickel is the most versatile metal in any alloy.

What is the most likely reason the author believes the lack of U.S. nickel production should not be a concern?
A) Nickel is not used outside of stainless steel and superalloys.
B) There are no active nickel mines in the United States.
C) Many laterite deposits containing nickel are located in the United States.
D) It is likely that imports of nickel will be available for the foreseeable future.

Which choice provides the best evidence for the previous question?
A) Lines 52-55 (“Approximately 80 . . . superalloys”)
B) Lines 67-70 (“There were . . . ores”)
C) Lines 84-87 (“The risk . . . come”)
D) Lines 89-91 (“Production from . . . depleted”)

According to the data in the figure, approximately a third of stainless steel and nickel alloys are used for
A) metal goods and transportation.
B) transportation and electronics.
C) engineering.
D) building and construction and tubular products.

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.
THIS PAGE IS LEFT INTENTIONALLY BLANK.
Questions 1-11 are based on the following passage.

I Told You I Was Sick!

Have you ever had the feeling that you were getting sick even though you had no sign of it yet? With all the bacteria in our bodies and in the world, it’s true that we’re never far away from a couple of coughs or sneezes. The inconveniences of coughs and sneezes aside, imagine the challenges for forensic or ancient scientists. It seems like it would be very difficult to know how ill someone was if that person is now a cadaver and thus cannot speak or exhibit symptoms. A recent study and procedure, even though, suggests that the ability to differentiate between carrying an illness and experiencing an illness may not be so far away.

Which choice most effectively sets up the information that follows?
A) NO CHANGE
B) Having probably never heard of this as a field of study,
C) In your magical fantasy place of the imagination,
D) Given this constant presence of bacteria and other potential invaders,

A) NO CHANGE
B) therefore,
C) thus,
D) however,
This procedure involves shotgun proteomics. Proteomics is the large-scale study of proteins. The term was coined in 1997 at the height of the popularity of genomics, fashionable it is the study of how genes combine to form living organisms. Proteomics is based on the idea that proteins are every bit as crucial in creating life as are genes. The “shotgun” component comes from genetics as well, wherein the searches for genome patterns follow an approach whose randomness is akin to the scattering shot; of a shotgun. Shotgun proteomics is used to identify complex mixtures of proteins, particularly where those proteins have become so intertwined that they are difficult to separate and individuate.
All of the information contained in the above paragraph is very technical. However, we do not need to be accomplished scientists to understand the discoveries made by shotgun proteomics. For scientists studying ancient disease, the challenge is usually that the bodies of those being studied have decayed past the point of usefulness. In some instances, as in freezing or mummification, the bodies are well-preserved, but the presence of those doesn't necessarily reveal whether the people actually suffered from the diseases.

Which choice most effectively combines the underlined sentences?

A) We do not need to be accomplished scientists to understand the shotgun-proteomics discoveries described in the extremely technical paragraph above.

B) All of the information contained in the above paragraph is very technical; however, we do not need to be accomplished scientists to understand the discoveries made by shotgun proteomics.

C) While all of this may be very technical, we don't have to be scientists to appreciate a unique new discovery made by shotgun proteomics.

D) While shotgun proteomics is complex as detailed in the complex paragraph above, we don't have to be scientists to understand shotgun proteomics at all.

A) NO CHANGE
B) certain pathogens
C) certain ones
D) them
This new process with the funny name, shotgun proteomics, is extremely difficult to pronounce. Researchers unearthed the mummies of three ancient Incans who died 500 years ago, and through shotgun proteomic analysis, these researchers determined that while all three mummies had traces of a particular lung disease, only two of the Incans actually experienced the symptoms of that disease while alive. The proteins of two of the subjects exhibited immune responses, and some traces of lung irregularity, throat laceration, and specimens of standing mucus under the nose gave further credence to the idea that the subjects suffered from some disease akin to tuberculosis. One other subject contained many of the same pathogens but showed no signs of infection.

These are exciting times for those who study disease in the ancient world. Even for those of us who don’t, however, these findings should still be exciting: after all, the better we understand disease from any era, the more able we are to prevent it in the future.
Questions 12-22 are based on the following passage.

The Fall of Elevation and the Rise of the Underground

By 1897, the city of Boston had a congestion problem. A rich tapestry of streetcars spread out all over the city. The problem, however, was that the streets remained mixed-use by streetcars, pedestrians, horses, and the new automobile. Boston's residents needed the streetcars to get where they needed to go from point A to point B, and if this incredible convenience were removed, the city's economic generators would shut down.

In 1897, city planners tried to relieve the congestion by moving some of the traffic underground. The Tremont Street subway became the first rapid-transit line in the United States. Most of the new off-street transit was not underground, however. It consisted of a variety of elevated rail lines that connected many of the places that had once been connected by the streetcar at the height of its use.

12. A) NO CHANGE  
   B) mixed-use by,  
   C) mixed-use, by,  
   D) mixed-use by:

13. A) NO CHANGE  
   B) to go,  
   C) to arrive, depart, or meander,  
   D) to go from here to there,

14. A) NO CHANGE  
   B) cure  
   C) heal  
   D) relax

15. At this point, the writer is considering adding the following sentence.  
   The development of underground transit was relatively slow in the United States: London's first underground rail line opened in 1863.  
   Should the writer make this addition here?  
   A) Yes, because it helps to explain the momentous achievement of the Tremont Street Line.  
   B) Yes, because it shows that Boston built its tracks ahead of New York City's but behind London's.  
   C) No, because it strays from the paragraph's exclusive focus on the United States.  
   D) No, because it digresses from the paragraph's discussion of mass transit in Boston.
On the one hand, the elevated lines had their own problems that had become particularly pronounced by the middle of the 20th century. They created a kind of visual congestion, and the noise from them could be overwhelmingly loud. Moreover, as Boston’s downtown districts sought to expand, they could not build as freely as they wanted to. The underground subways were grimier and more dangerous than the other riders certainly, but at least they were out of sight.

As a result, city planners decided that, because they could not eliminate the lines, having moved those lines underground. A prime candidate for the move underground was the Orange Line, which connected downtown Boston with neighborhoods and suburbs to the southwest. In fact, there have always been some antipathy toward the Orange Line: many have criticized the construction as having taken advantage of the politically powerless Irish Americans who did not have the clout to resist it.
Although the elevated Orange Line had been one of the city’s most reliable lines, the city chose to implement the new line and destroy the old one. The project cost $743 million, the most that the state of Massachusetts had paid on a project up to that point. In 1987, the new underground Orange Line began its operations. The line’s move below ground wasn’t an anomaly but part of a larger national trend.

There is a reason that Chicago is famed for its “El,” or “elevated,” trains: these elevated trains are some of the few remaining. While there are clear aesthetic advantages to having the trains underground, the cost of removing those eyesores can be exorbitant. Boston simply tore them down, but other cities, such as New York, have repurposed some of their old elevated-rail lines into public parks and green spaces.

These stories of urban transformation are, nevertheless, important reminders of how cities live and change. While few would dispute Boston’s move to take its trains underground, there is a certain discomfort in watching the familiar things in our lives turned in to others. It seems that just as people grow and mature, so too must the cities.

At this point, the writer wants to further reinforce the paragraph’s claim about the movement away from elevated trains. Which choice most effectively accomplishes this goal?

A) Nearly all of Boston’s rapid transit is now underground, including many of its buses.
B) The expansion of many underground lines continues today, as in Washington, DC, where the Metro is constantly expanding.
C) Despite the movement of trains underground, Boston’s traffic problem has never quite gone away.
D) Boston itself has a relatively small population, but its metropolitan area is large.

A) NO CHANGE
B) all in all,
C) this being the case,
D) however,
Questions 23-33 are based on the following passage and supplementary material.

The Ghost in the Machine

As political seasons heat up, voters listen to many speeches by the candidates or those who support them. The president, it seems, gives a new speech every day. How is it possible, then, that these candidates and officeholders have the time amid all their other duties to craft elegant speeches? The answer is simple; a team of speechwriters. Just as these writers can convey the intended message so too can they have the written copy on the ready for whenever the politician is ready to say it out loud. Politicians can be great orators.

The writer wants to convey an attitude of genuine admiration and to avoid the appearance of sarcasm. Which choice best accomplishes this goal?

A) NO CHANGE
B) love and adore
C) fawn over
D) control

A) NO CHANGE
B) simple: a team
C) simple—a team,
D) simple, a team:

The writer wants the information in the passage to reflect the humorous rendering contained in the cartoon and to be consistent with other information in the passage. Given that goal, which of the following sentences would best be included here?

A) NO CHANGE
B) Sometimes the writers know a politician better than he knows himself.
C) Speechwriting is a job that is best done while the writers are standing up.
D) Politicians typically have no experience in the trade of speechwriting.
Many speechwriters start as creative writers, but in pursuit of great personal fame, they turn to speechwriting as a way to use their talents in support of causes they care about. Whether a speechwriter is in favor of a flat tax or against it, whether a speechwriter is a Democrat or a Republican, that speechwriter knows the value of the written word. As a result, some of the most elegant prose in American (and world) history have come from the pens of those whose names very few know.

[1] The median salary for a speechwriter is about $115,000 per year. [2] Speechwriting is also unique in that it draws on such a wide variety of skill sets that it needs people from many different backgrounds. [3] Certainly a creative writer knows whether to put the final rhetorical touches on a speech and can choose the perfect metaphor, but those with specialties in economics, politics, and history need to be involved as well. [4] It is well-known, therefore, that those in high-powered offices who have to give new speeches frequently employ teams of speechwriters, some of whom write as much as 25,000 words a month. [5] A 300-page novel is usually around 100,000 words.

27 Which choice most effectively continues the contrast in the sentence and is consistent with the information in the rest of the passage?
A) NO CHANGE
B) finding they have little writing talent,
C) urged by political passions,
D) wanting to get into novels another way,

28 A) NO CHANGE
B) come
C) comes
D) is coming

29 A) NO CHANGE
B) created writer knows how
C) created writer knows whether
D) creative writer knows how

30 To improve the cohesion and flow of this paragraph, the writer wants to add the following sentence.
That’s pretty impressive given that most writing careers pay far less.
The sentence would most logically be placed after
A) sentence 1.
B) sentence 2.
C) sentence 3.
D) sentence 4.
For the aspiring writer, speechwriting may be a less-than-glamorous profession. Every clever turn of phrase that is born in the writer’s mind comes out of someone else’s mouth. The glory may not go to precisely the right person, but there are larger rewards to speechwriting than personal fame. Fame can be difficult to obtain and fleeting once achieved. Speechwriting provides the opportunity to use rare skills in an arena that can actually make a huge difference in people’s lives. In some ways, the speechwriters have a unique amount of power: their words are as powerful as their bosses’ words. If your candidate supports causes that you care about, then why wouldn’t you want to help him or her polish up on the talking points for a big debate?

31. A) NO CHANGE
   B) fame, which
   C) fame, and fame
   D) fame, but this fame

32. A) NO CHANGE
   B) their words are as powerful as they’re
   C) their words are as powerful as their
   D) their words are as powerful as their

33. Which choice most effectively concludes the sentence and paragraph?
   A) NO CHANGE
   B) take a little credit for all the hard work you’ve done on a successful campaign?
   C) share the message with the broadest possible audience in the clearest possible way?
   D) find some special representation in government for your own interests as a writer?
Questions 34-44 are based on the following passage.

A Ray of Light from India

[1] While Hollywood churns out films at an incredible clip, many people do not realize that the film industry in the United States is only the third largest in the world. [2] Although the United States produced a whopping 707 films in 2014, it ranked well behind India's stunning 1,966 films. [3] India's answer to Hollywood, called Bollywood, is far and away the largest film producer in the world. [4] India's highest grossing film in 2014 was called PK and was directed by Rajkumar Hirani. [5] In the high-profile world of blockbusters, however, many of the most important films and film artists are overshadowed. [6] Just as most American films do not make it beyond national borders, most Indian films remain where they are in the boundaries of India.

34. A) NO CHANGE  
   B) are  
   C) was  
   D) have been

35. A) NO CHANGE  
   B) remain within  
   C) sit where they are now inside  
   D) hang out and don't move within

36. To make this paragraph most logical, sentence 4 should be  
   A) placed where it is now.  
   B) placed after sentence 2.  
   C) placed at the end of the paragraph.  
   D) DELETED from the paragraph.
One director, Satyajit Ray, is so influential as to defy national categorization—however, Ray was born in Bengal in 1921, when India was still a British colony. His family was powerful in the art scene at the time. These varied influences—cultural factors, artistic inspirations, and national identities—led to Ray’s unique style. In fact, just as Ray was meeting the directors who would inspire him most, India achieved its independence from Britain in 1946.

Perhaps it was Ray’s feeling of dual citizenship or his belief that film was a republic entirely unto itself. In any case, the influence that people have from watching Ray’s films became known the world over. Every major film critic of the era placed his films alongside those of the European masters like Federico Fellini and Ingmar Bergman. His “Apu trilogy,” detailing the life of a young Indian boy growing up in pre- and post-independence India, is regularly listed among the greatest films of the twentieth century. The first film in the series, *Pather Panchali* (1955), is regarded as one of the greatest films produced anywhere and at any time. Anyone watching this movie now is still likely to have their intellect engaged and their heart overflowing.
Ray grew up with the Indian film industry, and although he departed from making traditional Indian films relatively early on, he was extremely popular in his home country. While Mahatma Gandhi could show the world audience what it meant to struggle nobly for independence, Satyajit Ray demonstrated audiences what richness was contained in individual lives, especially when those lives were lived among trying conditions.

Ray’s achievement is all the greater for having taken place at a moment when Western audiences had grown tired of European and American films and filmmakers. Now, however, as Western countries become more diverse, Ray’s influence could be more powerful than ever as his films show the value of cross-cultural connection and humanitarian understanding.

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

In a broader sense, the respect he gained from critics abroad put India on the map in a new way.

Should the writer make this addition here?

A) Yes, because it introduces a point that is expanded in the following sentence.
B) Yes, because it demonstrates some of the techniques that made Ray’s films special.
C) No, because it restates information stated throughout the passage as a whole.
D) No, because it is irrelevant to the focus of this paragraph and the essay more generally.

Which choice results in a sentence that best supports the point developed in this paragraph?

A) NO CHANGE
B) hungered for more than
C) were interested almost exclusively in
D) were losing patience with the sameness of

Which choice results in a sentence that best supports the point developed in this paragraph?

A) NO CHANGE
B) showed
C) manifested
D) performed

A) NO CHANGE
B) Soon,
C) Later,
D) Then,

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

25 MINUTES, 20 QUESTIONS

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

DIRECTIONS

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

NOTES

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

REFERENCE

The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is \( 2\pi \).
The sum of the measures in degrees of the angles of a triangle is 180.
1. \[2s - 3t = 10\]
   \[6s - 2t = 16\]

Which of the following ordered pairs \((s, t)\) satisfies the system of equations above?

A) \((-2, 0)\)
B) \((2, -2)\)
C) \((-2, 2)\)
D) \((2, 0)\)

2. Which of the following expressions is equal to 3 for some integer value of \(k\) ?

A) \(4k + 3\)
B) \(1 - 3k\)
C) \(2 + 2k\)
D) \(-k + 3k\)

3. If \(g(x) = 4x + 6\), then which of the following is equivalent to \(g(x + 1)\)?

A) \(4x + 10\)
B) \(4x + 7\)
C) \(4x + 6\)
D) \(4x + 5\)

4. A tennis ball factory manager estimates the number of non-defective balls that can be produced in a day using the expression \(10,000 - dh\), where \(d\) is the average number of defective balls produced per hour and \(h\) is the number of hours in a day's shift. Which of the following is the best interpretation of the number 10,000 in the expression?

A) The factory produces 10,000 non-defective balls in a day.
B) The factory produces 10,000 defective balls in a day.
C) The factory produces 10,000 non-defective balls and 10,000 defective balls in a day.
D) The factory produces a total of 10,000 balls in a day.
The total number of constitutional amendments adopted by the U.S. Congress from 1791 to 1992 is three less than three times the number of constitutional amendments adopted by the U.S. Congress in the year 1791. If the total number of constitutional amendments adopted by the U.S. Congress from 1791 to 1992 is 27, and the U.S. Congress adopted $p$ constitutional amendments in 1791, which of the following equations is true?

A) $27 - 3p = 3$
B) $3p = 27$
C) $3p = 30$
D) $27 = 3p + 3$

Which of the following is equivalent to the expression above?

A) $-m^4 - nm^2$
B) $mn^4 - 6m - 3nm^2$
C) $2m^4n - 3nm^2$
D) $2m^4n + 6m + nm^2$

In the $xy$-plane above, line $m$ is parallel to line $n$. What is the value of $a$?

A) 3
B) 4
C) 6
D) 8
9

\[ sE = 360 \]

In a regular polygon, the measure of an exterior angle \( E \), in degrees, is related to the number of sides, \( s \), of the polygon, as shown in the formula above. If the measure of an exterior angle is less than 80°, what is the least number of sides it can have?

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

10

Which of the following equations has the graph in the \( xy \)-plane such that \( y \) is always greater than or equal to \(-3\)?

A) \( y = x^3 - 4 \)
B) \( y = |x| - 4 \)
C) \( y = x^2 - 4 \)
D) \( y = (x - 4)^2 \)

11

\[ qx - 5y = 6 \\
6x - 7y = 5 \]

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

A) \( \frac{36}{5} \)
B) \( \frac{30}{7} \)
C) \( \frac{30}{7} \)
D) \( \frac{36}{5} \)

12

Which of the following complex numbers is equivalent to \( \frac{5 - 3i}{6 + 4i} \)?

(Note: \( i = \sqrt{-1} \))

A) \( \frac{5}{6} - \frac{3i}{4} \)
B) \( \frac{5}{6} + \frac{3i}{4} \)
C) \( \frac{9}{26} - \frac{19i}{26} \)
D) \( \frac{9}{26} + \frac{19i}{26} \)
13
What is the sum of all values of $p$ that satisfy $3p^2 - 18p + 9 = 0$?
A) $-6$
B) $-2\sqrt{6}$
C) $2\sqrt{6}$
D) 6

14
If $2a + b = 6$, then what is the value of $(9^a)(3^b)$?
A) $3^3$
B) $3^6$
C) $27^6$
D) It cannot be determined from the information given.

15
If $(2x + a)(3x + b) = 6x^2 + cx + 12$ for all values of $x$, and $a + b = 7$, then what are all possible values of $c$?
A) 3 and 4
B) 6 and 12
C) 8 and 9
D) 17 and 18
**DIRECTIONS**

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

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

5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If $3\frac{1}{2}$ 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.

<table>
<thead>
<tr>
<th>Fraction line</th>
<th>Grid in result.</th>
<th>Write answer in boxes.</th>
<th>Answer: 7/12</th>
<th>Answer: 2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{7}{12}$</td>
<td></td>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
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<td>9 9 9 9 9 9 9 9 9 9 9 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- $\frac{2}{3}$
- $\frac{6}{9}$
- $\frac{6}{9}$

Answer: 201 – either position is correct

**NOTE**: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.
Tony has created his team flag by joining four colored rectangles, red, yellow, blue and green, as shown in the figure above. He then added a white stripe that runs from one corner of the flag to the opposite base. If the flag has a total height of 36 inches, what is the height, in inches, of the blue rectangle?

At a dessert shop, each cupcake has 60 more grams of sugar than each frozen yogurt. If 3 cupcakes and 4 frozen yogurts have a total of 390 grams of sugar, how many grams of sugar does each cupcake have?

If one angle of a right triangle measures $a^\circ$, and the $\cos a^\circ = \frac{3}{5}$, then what is $\sin (90 - a)^\circ$?
19

\[12x + 3y = 90\]
\[ax + by = 15\]

In the system of equations above, \(a\) and \(b\) are constants. If the system has no solutions, what is the value of \(\frac{b}{a}\)?

20

If \(x = 2\sqrt{5}\) and \(4x = \sqrt{5}y\), what is the value of \(y\)?
Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

DIRECTIONS

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

NOTES

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

REFERENCE

\[
\begin{align*}
A &= \pi r^2 \\
C &= 2\pi r \\
V &= \ell wh \\
V &= \pi r^2 h \\
V &= \frac{4}{3} \pi r^3 \\
V &= \frac{1}{3} \pi r^2 h \\
V &= \frac{1}{3} \ell wh
\end{align*}
\]

The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is \( 2\pi \).
The sum of the measures in degrees of the angles of a triangle is 180.
1. Ted’s Yoga studio charges a membership fee of $60, which includes access to a locker and shower facilities. The studio then charges an additional $12.50 per class. If Aubri’s total bill for the month was $122.50, how many yoga classes did she attend?
   A) 4
   B) 5
   C) 9
   D) 10

2. Greenwood Academy’s softball team is trying to pick a new mascot and has narrowed down the options to the Armadillos and the Possums. The coach asks the members of the Junior Varsity and Varsity teams which mascot they prefer. The results are shown in the table below.

<table>
<thead>
<tr>
<th>Armadillos</th>
<th>Possums</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Varsity</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Varsity</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>27</td>
</tr>
</tbody>
</table>

   If a team member is chosen at random, what is the probability that it is either a Varsity member who prefers Armadillos or a Junior Varsity member who prefers Possums?
   A) \( \frac{24}{54} \)
   B) \( \frac{25}{54} \)
   C) \( \frac{29}{54} \)
   D) \( \frac{30}{54} \)

3. Samantha is trying to run for City Council, but she needs to have 500 total signatures on her petition in order to get on the ballot. She currently has 284 signatures and believes that her team of volunteers can get 28 signatures per day. Which of the following represents how many signatures Samantha expects to have in \( d \) days?
   A) \( 500 + 28d \)
   B) \( 28 + 284d \)
   C) \( 284 + 28d \)
   D) \( 500 – 28d \)

4. A veterinarian prescribes 110.25 mL of an antibiotic to her patient. The recommended dose, in mL, of the medication, \( D \), is given by the equation \( D = 60 + 0.67x \), where \( x \) represents the weight of the animal in kilograms. What is the weight of the animal the veterinarian is prescribing the medication for?
   A) 75
   B) 105
   C) 134
   D) 165
5. Which of the following is the sum of the above two polynomials?
   A) $3x^2 + 4x + 7$
   B) $4x^2 - 3x + 2$

   Which of the following is the sum of the above two polynomials?
   A) $7x^4 + 7x^2 + 5$
   B) $7x^4 + x^2 + 9$
   C) $7x^2 + 7x + 9$
   D) $7x^2 + x + 9$

6. When 3 times the number $n$ is added to 5, the result is 14. What number results when 6 times $n$ is added to 11?
   A) 14
   B) 15
   C) 29
   D) 49

7. The table above shows the number of votes cast in 2012, in thousands, in six southwestern states for the presidential election. Based on the table, if a ballot from the state of California in the 2012 presidential election is chosen at random, which of the following is closest to the probability that the ballot contained a vote for Obama?
   A) 0.32
   B) 0.40
   C) 0.56
   D) 0.60
On March 20, 2005, there were 2,300 fish in a pond that had a carrying capacity of 5,000 fish. Each year since then, the number of fish in the pond increased by 600. If $t$ represents the time, in years, since March 20, 2005, which of the following inequalities describes the set of years where the pond is below or at carrying capacity?

A) $600t + 2,300 \leq 5,000$
B) $600t \geq 4,400$
C) $600t \leq 5,000$
D) $t \leq 5,000 - 600$

A hospital conducted a survey to determine whether patients treated in the emergency room were satisfied with the level of care they received. The hospital mailed surveys to 550 randomly selected people who were treated in the emergency room the previous year, and 415 people responded. Which of the following factors makes it least likely that a reliable conclusion can be drawn about care-satisfaction of all emergency room patients at the hospital?

A) The survey distribution method
B) The time elapsed since the care was received
C) The size of the sample
D) The number of people who responded

Number of Petals on Each of 17 Flowers in a Garden

Based on the histogram above, of the following, which is closest to the average (arithmetic mean) number of petals per flower?

A) 6
B) 5
C) 4
D) 3
11 If the function $g$ has four distinct zeros, which of the following could represent the complete graph of $g$ in the $xy$-plane?

A)  

B)  

C)  

D)  

12 The milligrams of isotope Fermium-252 ($^{252}\text{Fm}$) in a sample are estimated over the course of fifteen days, as seen in the table.

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>Amount of $^{252}\text{Fm}$ (mg)</th>
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<tbody>
<tr>
<td>0</td>
<td>800</td>
</tr>
<tr>
<td>3</td>
<td>400</td>
</tr>
<tr>
<td>6</td>
<td>200</td>
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<tr>
<td>9</td>
<td>100</td>
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<tr>
<td>12</td>
<td>50</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

Which of the following best describes the relationship between time and the estimated milligrams of $^{252}\text{Fm}$ in the sample during the fifteen days?

A) Linear increase  
B) Exponential growth  
C) Linear decrease  
D) Exponential decay

13 The equation above gives the displacement $d$, in meters, of an object moving at an initial speed of $v_o$ meters per second for $t$ seconds. Which of the following gives acceleration constant $a$ in terms of $d$, $t$, and $v_o$?

A) $2\left(\frac{d}{t^2} - \frac{v_o}{t}\right)$  
B) $2(d + v_o t)$  
C) $-2\left(\frac{d}{t^2} + \frac{v_o}{t}\right)$  
D) $-2\left(\frac{d - v_o}{t^2}\right)$
Heights of 4-Year-Olds (in inches)

<table>
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<th>34</th>
<th>35</th>
<th>36</th>
<th>37</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>38</td>
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<td>39</td>
<td>40</td>
<td>40</td>
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<td></td>
<td>41</td>
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<td>43</td>
<td>44</td>
<td>45</td>
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</tbody>
</table>

The table above lists the heights, to the nearest inch, of a random sample of 18 four-year-olds at a school. The outlier measurement of 24 inches is an error. Of the mean, median, and range of the values listed, which will change the least if the 24-inch measurement is removed from the data?
A) They will all change by the same amount.
B) Range
C) Mean
D) Median

Questions 15–16 refer to the following information.

Angela is starting an exercise program that consists of swimming and lifting weights, and she is deciding what health club to join. The table below shows the initiation fee and the fees for access to the weight lifting equipment and the swimming pool for three different health clubs.

<table>
<thead>
<tr>
<th>Health Club</th>
<th>Initiation Fee, $I$ (dollars)</th>
<th>Fee to access weight-lifting equipment, $F$ (dollars per month)</th>
<th>Fee to access swimming pool, $S$ (dollars per month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>150</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>M</td>
<td>100</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>N</td>
<td>130</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

The total cost, $y$, for the initiation fee and access to the equipment and pool in terms of the number of months, $x$, is given by $y = I + (F + S) \times x$.

For what number of months, $x$, will the cost of the initiation fee and the two access fees at Club M be greater than or equal to the cost of the initiation fee and the two access fees at Club N?
A) $x \leq 5$
B) $x \leq 9$
C) $x \geq 5$
D) $x \geq 9$

If the relationship between the total cost, $y$, of the initiation fee and the two access fees at Club L and the number of months, $x$, for which the membership is used is graphed in the $xy$-plane, what does the $y$-intercept of the line represent?
A) The total cost of the initiation fee
B) The total monthly cost of the two access fees
C) The total monthly cost of the membership
D) The total cost of the membership
The iron content of a sample of hematite, in grams, is approximately 40% greater than that of a sample of low-grade iron ore. The iron content of the low-grade iron ore is 30 grams. Which of the following best approximates the iron content, in grams, of the sample of hematite?

A) 12  
B) 18  
C) 40  
D) 42

The half-life of radioactive substance carbon-14, defined as the time taken for the radioactivity of a specified isotope to fall to half its original value, is 5,730 years. If a sample originally contained 100 grams of carbon-14, which of the following functions can be used to solve for the amount $N$ of carbon-14 $t$ years from now?

A) $N(t) = 100(0.5)^t + 5,730$
B) $N(t) = 100(0.5)^{\frac{5,730}{t}}$
C) $N(t) = 100(0.5)^{\frac{5,730}{t}}$
D) $N(t) = 100(0.5)^{5,730t}$

If the point (0, 5) is a solution to the system of inequalities above when graphed in the $xy$-plane, which of the following must be true of the relationship between $h$ and $k$?

A) $h < -k$
B) $h > k$
C) $\frac{h}{k} = 1$
D) $|h| = |k|$
George is studying how amount of sleep affects test performance for the 21 students in his 8 a.m. history class. The scatterplot above shows the hours of sleep the night prior to and the scores received on the history midterm for each student. The line of best fit for the data is also shown. For the student who slept for 7 hours, the student’s actual score was about how many points more than the score predicted by the line of best fit?

A) 4  
B) 5  
C) 6  
D) 7
In the figure, \( \cos(x^\circ) = \sin(y^\circ) \), where \( x \) and \( y \) are both less than 90. If \( x = 5c - 4 \) and \( y = 3c + 2 \), what is the value of \( c \)?

A) 22.75  
B) 11.50  
C) 11.00  
D) 7.75

The bar graph above shows the number of minutes spent per day on household tasks in Great Britain, by task, for several household tasks performed by males and females.

Questions 23–24 refer to the following information.

23. In a scatterplot of this data, where time spent by females on household tasks is plotted along the \( x \)-axis and time spent by males on household tasks is plotted along the \( y \)-axis for each of the given tasks, how many data points would be below the line \( y = x \)?

A) 2  
B) 3  
C) 4  
D) 5
The amount of time spent by females on the care of children is approximately what percent greater than the amount of time spent by females on the care of clothes?

A) 10%
B) 45%
C) 56%
D) 80%

In the circle above, arc WXY is 6\pi in length. If \angle WXY is 72°, what is the radius of the circle?

A) 6
B) 15
C) 15\pi
D) 30

Polynomials \(a(x)\) and \(b(x)\) are defined above. Which of the polynomials below has a factor of \(3x + 2\)?

A) \(l(x) = a(x) + b(x)\)
B) \(m(x) = 3a(x) + b(x)\)
C) \(n(x) = a(x) - 3b(x)\)
D) \(p(x) = 2a(x) + 3b(x)\)

Assume that \(a\) and \(b\) are real numbers so that \(b < a < \frac{a}{b}\). Which of the following statements must be true?

I. \(b^2 > a\)
II. \(b < 1\)
III. \(a > 0\)

A) I only
B) I and II only
C) II only
D) II and III only
28

Which of the equations below represents the analogous form of function \( g \), where the minimum value of \( g \) appears as a constant?

A) \( g(x) = (x + 2)^2 - 16 \)
B) \( g(x) = (x + 2)^2 + 15 \)
C) \( g(x) = x^2 + 4x - 16 \)
D) \( g(x) = x^2 + 4x - 12 \)

29

Assume that \( a \) is the average of \( p \), \( 2q \), and \( 4 \); \( b \) is the average of \( 2p \), \( 4q \), and \( 8 \); and \( c \) and the average of \( 6p \), \( 3q \), and \( 6 \). What is the average of \( a \), \( b \), and \( c \) in terms of \( p \) and \( q \)?

A) \( p + q + 2 \)
B) \( p + q + 4 \)
C) \( 3p + 6q + 6 \)
D) \( 9p + 6q + 2 \)

30

In the equations above, \( p \) and \( q \) are constants. If \( p + q = 12 \), which of the following statements is true?

A) \( y \) minus \( x \) is 12
B) \( x \) minus \( y \) is 12
C) \( y \) is one-eighth of \( x \)
D) \( x \) is one-eighth of \( y \)
DIRECTIONS

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

1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. Mixed numbers such as $3\frac{1}{2}$ must be grided as 3.5 or 7/2. (If $3\frac{1}{2}$ 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: 201 – either position is correct

NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.
31. A climate change panel estimates that New York City’s sea levels are rising at a rate of 1.2 inches every 10 years. According to the panel’s estimate, how long will it take, in years, for New York City’s sea levels to rise by 14.4 inches?

32. In the $xy$-plane, the point (2, 10) lies on the graph of the function $f(x) = 2x^2 + bx - 8$. What is the value of $b$?

33. A regional radio station sells time slots for advertisements in 30-second intervals. If the station airs advertisements for 220 minutes per day, every day of the week, what is the total number of 30-second advertisement time slots the station can sell for Thursday and Friday?

34. A local frozen yogurt store views percentage rates of how many total viewers clicked on posts on its social media page. On the first 8 posts the store posted, the average (arithmetic mean) of the clicked-on percentage rates was 60%. What is the least value the page can receive for the 9th rating and still be able to have an average of at least 75% for the first 16 posts? (Disregard the % sign when gridding your answer.)
35

\[ c = 800t + 950 \]

Swathi made an initial contribution to a Roth IRA retirement account. Each year thereafter she contributed a fixed amount to the account. The equation above models the amount \( c \), in dollars, that Swathi has contributed after \( t \) yearly contributions. According to the model, how many dollars was Swathi’s initial contribution? (Disregard the $ sign when gridding your answer.)

36

In the figure above, point \( D \) is the center of the circle, line segments \( AB \) and \( BC \) are tangent to the circle at points \( A \) and \( B \), respectively, and the segments intersect at point \( B \) as shown. If the circumference of the circle is 64, what is the length of major arc \( AC \)?

Questions 37–38 refer to the following information.

Mali is a landlocked country in western Africa. In 2015, its population was estimated to be 14.5 million. For the following 10 years, the population of Mali was projected to grow by 3 percent each year; this relationship can be modeled by the equation \( P = 14.5(r)^y \), where \( P \) is the population, in millions, \( y \) years after 2015.

37

What is the value of \( r \) in the equation above?

38

What is the projected population of Mali in 2022, in millions, to the nearest tenth of a million?

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.
SAT Essay

ESSEY BOOK

DIRECTIONS

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

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

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

REMINDER

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

— An off-topic essay will not be evaluated.
As you read the passage below, consider how Dr. Nabil Sanadi uses

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

“Telehealth expansion needs payment, coverage policy advances” by Dr. Nabil El Sanadi, published on www.modernhealthcare.com, September 12, 2015.

1 Like many industries, healthcare is at a crossroads. One critical decision facing practitioners, especially those of us who operate major healthcare systems, is whether to invest more in our bricks-and-mortar operations or increase funding for cutting-edge telehealth information technology solutions.

2 At Broward Health in Florida, my staff and I ask ourselves constantly: Which path do we take?

3 The answer is both. While there is no future in which the face-to-face relationship between a patient and doctor does not exist—we will always need facilities—telemedicine’s potential is not only blossoming, it’s flourishing, even in disciplines that require the closest interactions between patients and doctors. To expand access to care, save patients precious time and money, and improve the quality of care, we all have to think more about telemedicine.

4 So must the state and federal policymakers who regulate us.

5 Five years ago, perhaps even to most healthcare providers, telemedicine meant nothing more than sitting in your primary-care doctor’s office teleconferencing with a specialty-care physician whose practice was miles away. When I first attended the Healthcare Information and Management Systems Society annual conference 10 years ago, there were a few vendors offering telemedicine products. Today, thousands of telemedicine vendors attend the annual gathering.

6 Telemedicine is much more than e-medical records and video chats; technology is now a vital tool in some of the practice areas thought to be the most hands-on.

7 For example, telepsychiatry is on the rise. Perhaps no doctor-physician relationship is more intimate than the one between patient and psychiatrist or psychologist, but one of the barriers to accessing mental healthcare for some Americans is the simple notion of sitting face to face with a stranger, pouring out emotions. Telepsychiatry may eliminate that anxiety for some patients—and provide them a path to the quality mental healthcare they so badly need, but might not have sought otherwise.

8 With the persistent shortage of healthcare practitioners in the U.S., hospitals have also begun to use telemedicine for intensive-care patient management. Tele-intensive-care units allow highly trained critical-care teams to remotely monitor patients in several locations at once. Tele-ICUs can improve patient outcomes, reduce mortality and generate cost savings for patients and hospitals—welcome outcomes in a care area that’s not only the costliest, but the one with the highest mortality rate.
Even surgery has gone virtual. Using robots they control remotely, physicians now operate on patients from thousands of miles away. The first transcontinental surgery was completed 14 years ago. Today, we can envision a future where a top pediatric surgeon in the U.S. can operate remotely on a sick child in the most far-flung, poorest parts of the world.

In a decade or two, we could all be “doctors without borders.”

However, to make that happen, government policies must encourage rather than inhibit healthcare technology.

According to a May 2015 American Telemedicine Association report, issues surrounding payment and coverage are one of the biggest barriers to telemedicine adoption. Only five states, according to the ATA, have the necessary policies in place to “accommodate” telemedicine adoption. Also, states can still choose whether to cover telemedicine under Medicaid. According to a July 2015 report by the Center for Connected Health Policy, three states still do not reimburse for live video telehealth; only 16 state Medicaid programs reimburse for remote patient monitoring; and 21 states do not offer a transmission or facility fee when telehealth is used.

Also, federal law, along with several state laws, does not yet require private insurers to provide coverage for telehealth services.

This bias against telehealth is ironic given the fact that the U.S. military has long been on the cutting edge of technology-based medicine. On the battlefield, regulations and reimbursement policies do not matter. What matters is saving lives.

Outside the battlefield, state and federal lawmakers of course must write reasonable regulations that ensure the welfare of patients. However, telemedicine is safe, effective and improves access to quality care, even in the disciplines that traditionally have required face-to-face interaction.

Our state and federal reimbursement policies simply have not advanced like telemedicine. Antiquated rules prevent doctors from improving and saving lives. It’s time for policymakers to update our laws to account for the balance that American healthcare providers are struggling to achieve every day.

Write an essay in which you explain how Dr. Sanadi builds an argument for government policies that support the development of health care technology. In your essay, analyze how Dr. Sanadi uses one or more of the features listed above (or features of your own choice) to strengthen the logic and persuasiveness of his argument. Be sure that your analysis focuses on the most relevant aspects of the passage.

Your essay should not explain whether you agree with Dr. Sanadi’s claims, but rather explain how the author builds an argument to persuade his audience.
Section 1—Reading

1. A B C D  
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Section 2—Writing and Language Skills

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Section 3—Mathematics: No Calculator

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.

Section 4—Mathematics: Calculator

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