

First Choice College – One Hour Diagnostic

Reading Test

21 MINUTES, 17 QUESTIONS

Mark your responses on this test. Use the “How to Calculate Your Scores in the back of this book to determine your scores.

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 1-8 are based on the following passage.

The following pair of articles were written by Peace Corps volunteers in different parts of the world. The first is titled “From a Ghetto Brownstone to a Jungle Brown Hut,” and the second is titled “From Hawaii to Benin.”

Passage 1

It was April of 1975 when I began my Peace Corps service in the Central American nation of Belize. Fresh out of junior college, I
Line longed for an opportunity to travel, to meet
(5) new people, to experience new cultures, and to apply my skills as an apiculturist (beekeeper).

I was stationed in the southernmost portion of Belize, living in the rural village of
(10) San Antonio among Mayan Indians. The ancient Mayans were empire builders in Mesoamerica and were the first beekeepers in the New World. Ironically, 1,200 years later, this young African-American from
(15) Brooklyn, New York would be teaching the Mayans how to raise the European honeybee.

Belize has many ethnic groups, represented by people of African, Hispanic,
(20) Asian, and Indian descent. To the Mayans, I later discovered, I looked to be Creole (mixed race), but I confused them with my distinctive “Brooklyn” accent. For weeks, many of San Antonio’s villagers did not

(25) believe that I was a Peace Corps Volunteer. The only Peace Corps Volunteers the Mayans ever knew or saw had been Caucasian Americans.

The Mayans and I accomplished more
(30) than expected. We increased the number of beehives in the country five-fold, built a honey processing plant and exported tons of honey to England. Never lost was the fact that the Mayans now had a new, dependable
(35) cash crop to purchase seed, soap, and kerosene.

Still, some of my fondest memories are of the Mayan children who would come to my village extension office in droves and
(40) inquire about every conceivable item on my desk. I can still hear the short staccato sounds of their Mopan language, “*Qua a bail ada Mista Hendree?*”

“That’s a label maker,” I would say
(45) before spend an hour or so making everyone labels of their names.

They weren’t the only ones who learned, however. My time in the village in the Mayan mountains helped me to realize that in order
(50) to truly appreciate life, one must experience a different way of living.

Passage 2

Growing up in Hawaii, I was always surrounded by varying cultures and



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languages: Japanese, Chinese, Filipino, (55) Samoan, native Hawaiian, and so on. Even most white people I knew claimed a European heritage like Portuguese. As an African American woman, I was different from everyone around me. I grew up (60) experiencing and appreciating ethnic diversity, cultural exchange, and religious differences. This multi-cultural, multi-lingual setting was the foundation for my pursuing the Peace Corps.

(65) The Peace Corps was the ultimate cross-cultural experience, and so I will be sad to say farewell to it. Learning new cultures was always my main goal. I didn't go in with arrogant ideas of saving native villagers from (70) themselves by teaching them the American way of doing things. I wanted to learn and experience what they could teach me. When I was posted in a small bush village in Benin, I was thrilled, thinking that I had gotten (75) exactly what I wanted—a remote place with optimal opportunity for cultural immersion. Little did I know how much the Beninese would learn about Americans through me.

As an environmental volunteer, I have (80) helped women's groups find money and supplies to start tree nurseries as both reforestation and money-earning ventures. I taught schoolchildren the importance of tree planting and wood conservation. In Benin, (85) the Sahara desert slowly encroaches from the north because of severe deforestation. Trees hold the topsoil from washing away, so conservation becomes vital in keeping the desert at bay.

(90) I vividly remember the way that women and girls would sit for hours and watch me write letters home or read a novel. My reading and writing fascinated them. Perhaps because of this, during my second (95) year, the number of girls in elementary school in my neighborhood has risen significantly.

From my time in Peace Corps, I have (100) learned much from the Beninese, such as unending generosity. Numerous times, villagers offered me chicken, fish, and eggs, all of which they needed far more than I did. No matter who you are, what you look like, or where you are from, in Benin, you will (105) always have food to eat, shelter out of a rainstorm, and a place to rest your head for the night.

What I will recall most about my Peace

(110) Corps experience is learning to appreciate small details about myself and others. In the end, it's the little things that make a lasting difference.

1. In both passages, the first paragraph serves to
 - A) explain the author's reasons for becoming a Peace Corps volunteer.
 - B) describe the people the author helped.
 - C) provide a description of the author's upbringing.
 - D) convince the reader to consider joining the Peace Corps.
2. During his assignment in Belize, the author of Passage 1 primarily intended to
 - A) teach children about American culture.
 - B) help Mayans learn to keep honeybees.
 - C) earn extra money by selling honey.
 - D) purchase seed, soap, and kerosene.
3. Which of the following best supports the answer to the previous question?
 - A) Lines 14-17 (“this young...honeybee”)
 - B) Lines 30-33 (“We...England”)
 - C) Lines 33-36 (“Never...kerosene”)
 - D) Lines 37-41 (“Still...desk”)



First Choice College – One Hour Diagnostic

4. The author of Passage 1 most likely included the story about the children and the label maker (lines 37-46) in order to
- A) explain why he enjoyed the children's company more than the adults'.
 - B) show how the children taught him valuable lessons.
 - C) illustrate his warm interactions with the villagers.
 - D) show how remote the village in Belize was.
5. As it is used in line 50, "appreciate" most nearly means
- A) acknowledge.
 - B) enjoy.
 - C) gain.
 - D) praise.
6. As it is used in line 75, "remote" most nearly means
- A) unlikely.
 - B) aloof.
 - C) irrelevant.
 - D) distant.
7. According to Passage 2, how does reforestation keep the desert away?
- A) Trees can't grow in the desert, so if there are trees, there is no desert.
 - B) Trees keep the topsoil in place, and without topsoil, the desert takes over.
 - C) Tree nurseries provide income that allows the villagers to purchase topsoil to replace what washes away.
 - D) Trees help to create moisture, which keeps the desert away.
8. The author of Passage 2 suggests that
- A) she tutored the women and girls in reading and writing.
 - B) girls were not allowed to attend school before she visited Benin.
 - C) her example of reading encouraged girls in Benin to attend school.
 - D) she acted as a schoolteacher while in Benin.



First Choice College – One Hour Diagnostic

Questions 9-17 are based on the following passage.

Adapted from a 2015 article titled “The Case for Drinking Whole Milk,” written by Deena Shanker.

At one time, Americans primarily drank whole milk—no-fat and lower-fat milks were relatively rare. When the anti-fat movement of the 1980s took hold, these low-fat

(5) alternatives saw their popularity rise. Today, most people consider creamy whole milk, like the milkmen who once delivered it, to be a relic of the past.

Though it would seem logical that (10) consuming less fat would lead to being less fat, that’s not what the science says, especially when it comes to dairy fat. In 2006, a study published in the *American Journal of Clinical Nutrition* looked at the

(15) role of dairy consumption in weight regulation for 19,352 Swedish women. It found that the women who consumed one or more servings per day of whole dairy products was “inversely associated with (20) weight gain.” More recently, the *European Journal of Nutrition* published a meta-analysis of 16 studies on the relationship between dairy fat, obesity, and (25) cardiometabolic disease. It found that “high-fat dairy consumption within typical dietary patterns is inversely associated with obesity risk.”

This paradox begs the question: Why (30) does eating high-fat foods seem to lower the risk of obesity?

One possible explanation, according to (35) Walter Willett of the Harvard School of Public Health, is that full-fat dairy better satiates the appetite. “It is also possible that some of the fatty acids in milk products have an additional effect on weight regulation,” he says. In addition, many low-fat and fat-free dairy products compensate for lost flavor by adding sugar, which certainly induces weight (40) gain.

But what about the other health risks associated with consumption of saturated fat? Saturated fat has long been associated with heart disease, but science is challenging (45) this conventional wisdom as well. A 2010 meta-analysis published in the *American Journal of Clinical Nutrition* found “no significant evidence for concluding that

dietary saturated fat is associated with an (50) increased risk of coronary heart disease or cardiovascular disease.” Further meta-analyses also concluded that the evidence simply does not support a recommendation of low consumption of saturated fats.

(55) And while whole milk seems far less harmful than it has been made out to be, it certainly has health benefits. Milk is a good source of vitamins A, D, and B, calcium, protein, potassium, riboflavin, niacin, and (60) phosphorous. Milk certainly isn’t the only—or even the best—source of these nutrients, but whole milk provides far better nutrition than skim milk. This is because many nutrients, including vitamins A and D, are fat (65) soluble—the body can’t absorb them without fat.

Health advocates like to promote eating (70) “whole foods” that haven’t been overly processed. Lower fat milks go through more processing than their whole counterpart. Taking the fat out of milk is a high-tech endeavor. First, fat is removed in a centrifuge; next, synthetic vitamins are added to the milk to replace those that have (75) been lost; for 1% or 2% milk, fat is then added back in through additional processing. Whole milk undergoes processing as well since almost all milk is pasteurized, but because it remains closer to its original state, (80) it is a more natural—and more nutritious—food than reduced-fat milk.

All of this leads to the same conclusion that most nutritionists agree on: Everything (85) in moderation. Eat too much of anything, and it will likely hurt you. But in moderation, whole fat dairy is not only safe, but beneficial.



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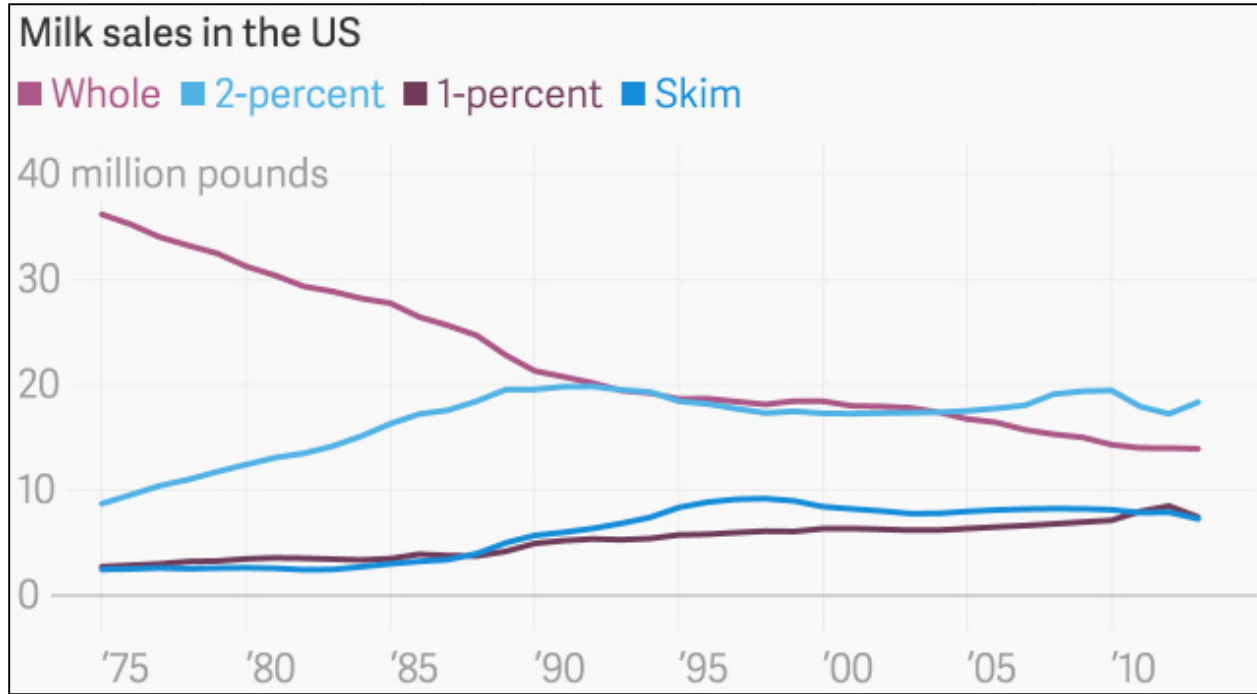
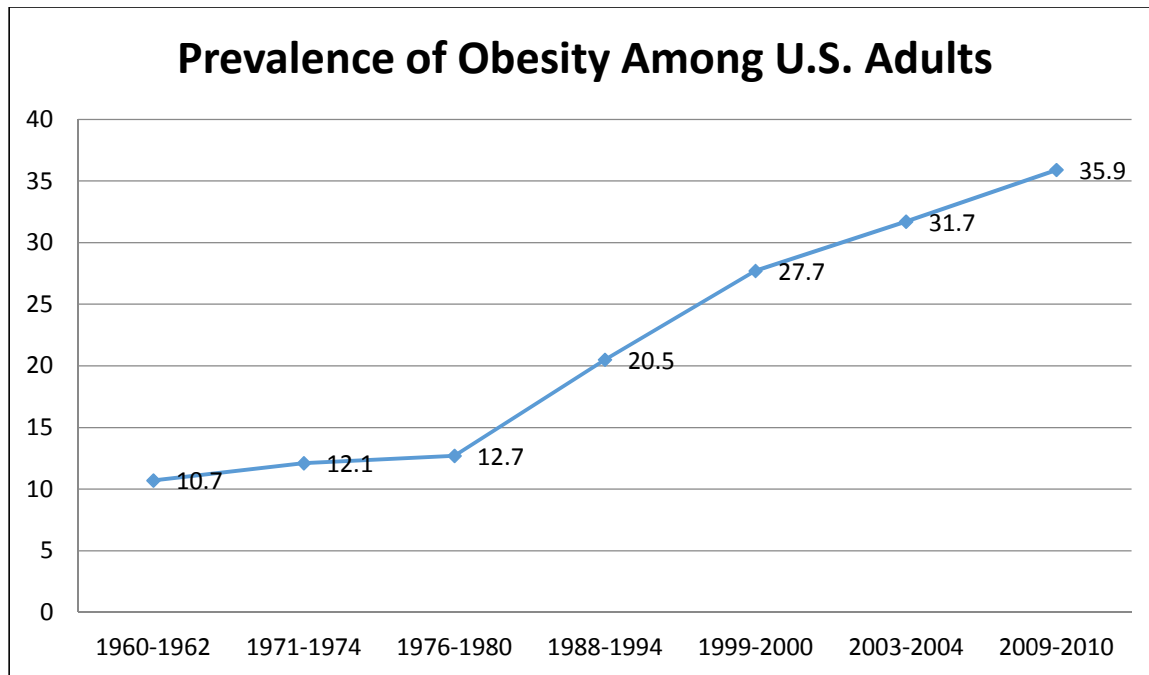


Figure 1: Shows the change in milk sales in the U.S. from 1975 to 2010.



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Figure 2: Shows the percentage of U.S. adults who were obese from 1960 to 2010.

9. The author likely included the phrase “like the milkmen who once delivered it” (lines 7) in order to
- A) show that the switch from whole milk to low-fat milk also destroyed jobs.
 - B) provide an image to emphasize how old-fashioned whole milk seems.
 - C) show that whole milk has been eliminated from modern stores.
 - D) explain that whole milk can only be purchased from milkmen.
10. Which of the following is not given as a possible reason for why whole milk consumption seems to lower the risk of obesity?
- A) Whole milk better satiates the appetite.
 - B) Fatty acids in whole milk help to regulate weight.
 - C) Whole milk is lower in sugar than reduced fat products are.
 - D) Whole milk has more vitamins A and D than reduced fat milk does.
11. As it is used in line 38, “compensate” most nearly means
- A) refund.
 - B) atone.
 - C) offset.
 - D) improve.
12. According to the passage, whole milk’s high levels of saturated fat
- A) do not cause heart disease.
 - B) prevent the absorption of valuable nutrients.
 - C) prevent the absorption of sugar.
 - D) made milk popular during the 1980s.
13. Which of the following best supports the answer to the previous question?
- A) Lines 3-5 (“When...rise”)
 - B) Lines 37-40 (“In...gain”)
 - C) Lines 45-51 (“A 2010...disease”)
 - D) Lines 63-66 (“This...fat”)
14. As it is used in line 65, “absorb” most nearly means
- A) assimilate.
 - B) process.
 - C) consume.
 - D) involve.
15. Which of the following is one reason given in the passage for why whole milk is more nutritious than reduced-fat milk?
- A) Whole milk does not cause heart disease.
 - B) Whole milk contains fatty acids.
 - C) Whole milk is less processed.
 - D) Whole milk is more processed.



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16. Which of the following provides the best evidence in support of the answer to the previous question?
- A) Lines 34-37 (“It...says”)
 - B) Lines 43-45 (“Saturated...well”)
 - C) Lines 72-76 (“First...processing”)
 - D) Lines 77-81 (“Whole...milk”)
17. It can be most strongly inferred from the passage and the graphs that
- A) the obesity rate began to increase substantially around the same time that whole milk sales began to fall significantly.
 - B) the primary cause of the rise in obesity from 1975 to today has been the reduction in whole milk consumption.
 - C) because milk sales have held relatively steady since the 1990s even as the obesity rate has continued to rise, milk consumption can have no impact on obesity.
 - D) people who stopped drinking whole milk began to consume large amounts of saturated fat from other sources.

STOP

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



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First Choice College – One Hour Diagnostic

Writing and Language Test

12 MINUTES, 15 QUESTIONS

Mark your responses on this test. Use the “How to Calculate Your Scores in the back of this book to determine your scores.

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 it is best to leave the relevant portion of the passage as it is.

Questions 1-11 are based on the following passage.

Though many people believe in the benefits of marrying young, recent research 1 will show that age may be the biggest predictor of marriage success. There are several factors related to age that strongly shape the health of a marriage, including income, education level, and whether couples live together.

1. A) NO CHANGE
B) will be showing
C) has shown
D) showed



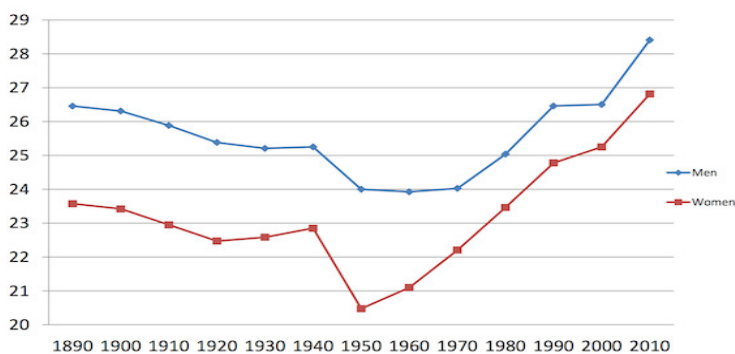
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Based solely on common statistics, [2] this may seem counterintuitive. Over the last half-century, Americans have married later and later. According to the U.S. census, today's young adults marry [3] at least eight years later than their counterparts did in the 1950s. Yet as marriage ages have risen, marriage has also become less common and less stable. In 1960, less than 9 percent of people over the age of 25 had never married. Today, that proportion is 20%, meaning that 42 million Americans have never tied the knot. Moreover, divorce rates have increased by more than 100% since the mid-20th century and, by some evidence, approximately one in two marriages now end in divorce.

[1] On the surface, these statistics suggest that as marriage age went up, so did divorce rates; thus, it would seem that there is, at the very least, a correlation between higher marriage age and divorce. [2] This is misleading, however. [3] Divorce rates skyrocketed for decades, [4] so they peaked in the mid-1990s. [4] Since then, divorce rates have been declining, and many sociologists believe that this is because marriage age has been increasing. [5] Other sociologists are not yet ready to make an opinion based on the data. [5]

Figure 1. Median Age at First Marriage by Sex: 1890 to 2010



Source: U.S. Decennial Census (1890-2000); American Community Survey (2010). For more information on the ACS, see <http://www.census.gov/acs>



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2. Which choice results in the most effective transition to the information that follows in the following paragraph?
A) NO CHANGE
B) this is the most logical result.
C) it is clear which of these factors is most important.
D) income and education seem to be the most important factors in marital success.
3. Which choice offers an accurate interpretation of the data in the chart?
A) NO CHANGE
B) no more than five years later
C) between four and six years later
D) between six and eight years later
4. A) NO CHANGE
B) but
C) however
D) although
5. Which of the following sentences should be removed in order to improve the focus of this paragraph?
A) Sentence 1
B) Sentence 3
C) Sentence 4
D) Sentence 5

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In fact, the relationship between age and marriage stability seems to **6** go above and beyond the actual marriage itself. For years, researchers wondered why couples who cohabit before getting married are more likely to get divorced. Recent research suggests that it is not, in fact, cohabitation that impacts divorce rates, but rather the age of the couple when they began living together that most strongly predicted an eventual divorce.

The secret to a stable marriage might be waiting to marry, but not because wisdom comes with age (or, at least, not only because wisdom comes with age). People who marry older generally have better education, higher incomes, and stronger support systems than those who marry young. All of these factors greatly contribute to the stability of a marriage. In other words, while marrying older does correlate with likelihood for marital success, it's still unclear whether age-related factors or age itself which **7** determine marital stability.

6. A) NO CHANGE
B) go above and beyond the actual marriage
C) extend the actual length of the marriage itself
D) extend beyond the actual marriage

7. A) NO CHANGE
B) determines
C) is determining
D) are determining



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Questions 8-15 are based on the following passage.

When we think of the moon, 8 one thinks of a dead, cratered planetoid without an atmosphere. Yet other moons in our solar system can be very 9 different. The innermost of Jupiter’s moons, Io, is a volcanic powerhouse with constant eruptions and seismic shifts that constantly reshape the moon’s surface. In recent months, however, scientists have gotten a clear and close look at Io’s volcanic activity, especially in one spot.

The large binocular telescope Interferometer, an extremely powerful telescope, has given scientists a hi-definition look at Io. The image is not crystal clear, but what makes it impressive is the distance at which these photographs have been taken: 600 million kilometers away. Each pixel in the pictures this telescope takes is the rough equivalent of 100 square kilometers.

One particular spot on Io is heavily 10 volcanic, and has been spotted by scientists in decades past. They named this volcanic spot “Loki” after the Norse trickster god. Over 200km – or 120 miles – in diameter, the “Loki” spot is what is known as a patera. 11 As the lake fills with lava, this crust periodically sinks into the lava below, and then as the lake cools, the crust becomes solid again. These cycles are what the scientists are able to spot from Earth. Before the use of the large binocular telescope Interferometer, all they could see was a single spot. Now, astronomers can tell that almost all of the 200km area is subject to a great deal of seismic activity. Not only that, they also spotted two other areas of heavy volcanic activity—Io was, perhaps, more active than anyone could have guessed.

8. A) NO CHANGE
B) we think
C) you think
D) they think
9. Which choice most effectively combines the sentences at the underlined portion?
A) different and the
B) different, like the
C) different; the
D) different, for example, the
10. A) NO CHANGE
B) volcanic and has
C) volcanic. Io has
D) volcanic which has
11. The writer is considering adding the following sentence here. Should the writer make this insertion?
A patera is an entire lake of lava, covered by a solidified lava crust.
A) No, because the reader should already know what a patera is.
B) No, because it detracts from the overall focus of the passage.
C) Yes, because knowing the definition of patera is important to understanding the passage.
D) Yes, because the paragraph is currently lacking in factual information.



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[1] **12** What benefit does the study of a moon of Jupiter allow?

Scientists argue that by studying volcanism on worlds other than Earth, they can get a better grasp of how it works here. [2] “It’s becoming **13** clear” said one researcher, “that volcanism on the Earth is part and parcel of what makes it a habitable planet, and so understanding how these processes work off-world helps us address a number of issues in exoplanetary science.” [3]

Understanding how Io’s seismic properties work could also aid our understanding of what makes a planet livable. [4] The accepted idea of habitable planets posits that they must be in a “Goldilocks zone” – not too hot, not too cold – but Io’s volcanoes offer another solution: **14** they must be seismically active. **15**

12. Which choice most effectively sets up the paragraph?

- A) NO CHANGE
- B) Why would anyone care about studying volcanoes?
- C) The study of Io may not have too many ramifications on Earth, however.
- D) Many of the volcanoes on Io are much more seismically powerful than those on Earth.

13. A) NO CHANGE
B) clear said
C) clear”, said
D) clear,” said

14. A) NO CHANGE
B) it
C) habitable planets
D) volcanoes

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

- A) where it is now.
- B) before sentence 1.
- C) before sentence 2.
- D) after sentence 4.

STOP

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

Do not turn to any other section.



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Math Test – No Calculator

9 MINUTES, 7 QUESTIONS

Mark your responses on this test. Use the “How to Calculate Your Scores in the back of this book to determine your scores.

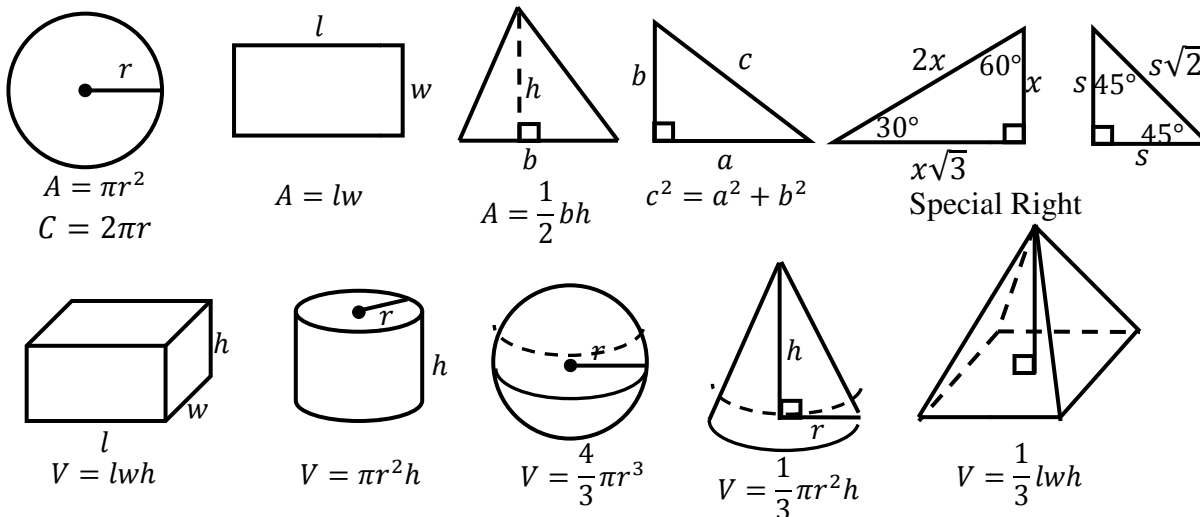
DIRECTIONS

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 the test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



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

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

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



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1. Victoria needs to have at least \$30 dollars to be able to go on her class field trip to an amusement park. Currently, she has \$5.00. For every dog she washes, she earns \$3.50. Which of the following inequalities can be solved to find x , the minimum number of dogs she must wash to be able to go on her field trip?

- A) $5.00 + 3.50x \leq 30.00$
- B) $3.50 + 5.00x \leq 30.00$
- C) $5.00 + 3.50x \geq 30.00$
- D) $3.50 + 5.00x \geq 30.00$

$$\begin{aligned}3y - 2x &= 12 \\8x + 48 &= 12y\end{aligned}$$

2. Which ordered pair (x, y) satisfies the system of equations shown below?
- A) $(3, 6)$
 - B) $(-3, 2)$
 - C) $(-6, 0)$
 - D) All of the above ordered pairs satisfy the system of equations given.

$$62x + y = 720$$

3. A video game store is running a promotion in which a number of 20%-off coupons are given away each day. The equation above can be used to model the number of coupons, y , that remain to be given away x hours after the promotion began. What does it mean that $(10, 100)$ is a solution to this equation?
- A) During the promotion, 100 coupons are given away for the first 10 hours.
 - B) It takes 10 hours for 720 coupons to be given away.
 - C) After 10 hours, 100 coupons still remain to be given away.
 - D) After 62 hours, 100 coupons still remain to be given away.



First Choice College – One Hour Diagnostic

4. The population of a species of turtle decreases by half every 3 years. The population at the beginning of 2012 was estimated to be 1,000 turtles. If P represents the population n years after 2012, then which of the following represents the class's model of the population over time?

A) $P = 1000 - \frac{1}{2}(3)^n$

B) $P = 1000 - 3\left(\frac{1}{2}\right)^n$

C) $P = 1000\left(\frac{1}{2}\right)^{3n}$

D) $P = 1000\left(\frac{1}{2}\right)^{\frac{n}{3}}$

$$x^2 + y^2 = 9$$

$$x = \sqrt{3}y$$

5. What is a possible solution, (x, y) , to the system of equations above?

A) $\left(-\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$

B) $\left(\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$

C) $(-\sqrt{3}, 1)$

D) $(\sqrt{3}, 1)$

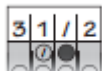


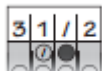
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DIRECTIONS

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

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



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

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

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

Write answer in boxes. →

7	/	1	2
○	○	○	○
○	○	○	○
0	0	0	0
1	1	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	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

← Decimal point

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

2	/	3	
○	○	○	○
○	○	○	○
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	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	0
1	1	1	1
2	2	2	2
3	3	3	3

2	0	1	
○	○	○	○
○	○	○	○
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3

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



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6. If $\frac{1}{3}x - \frac{2}{5}y = 12$, what is the value of $5x - 6y$?

7. If $x - 5$ is a factor of $x^2 - 2ax + 5a$, where a is a constant, what is the value of a ?

STOP

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



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Math Test – Calculator

18 MINUTES, 12 QUESTIONS

Mark your responses on this test. Use the “How to Calculate Your Scores in the back of this book to determine your scores.

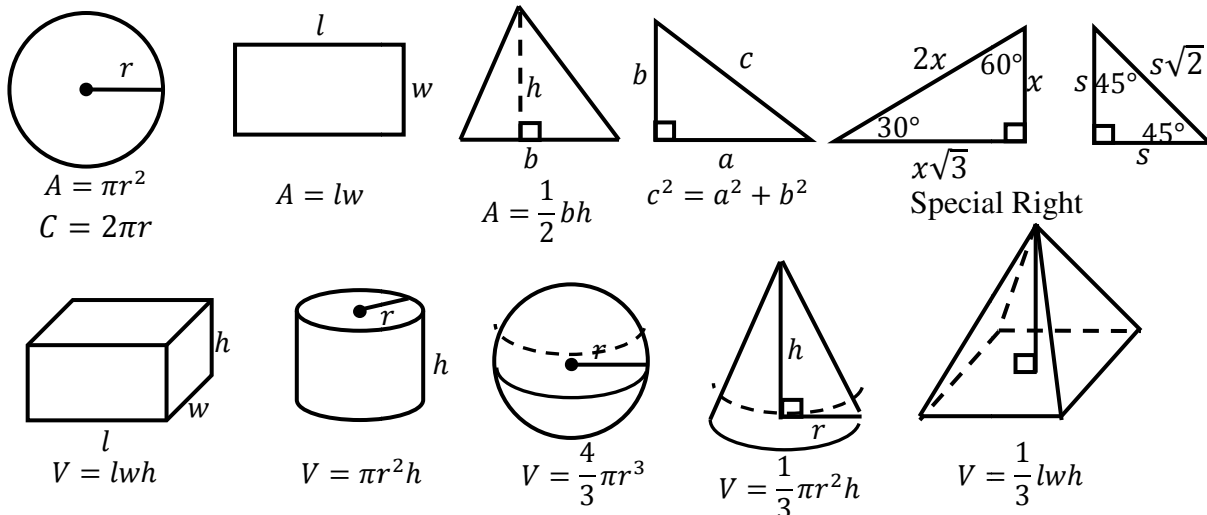
DIRECTIONS

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 the test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



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

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

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



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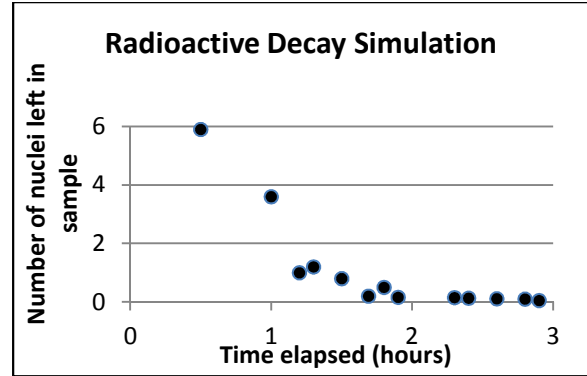
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1. What is the slope of the line that passes through the points $(-\frac{2}{3}, 4)$ and $(\frac{4}{3}, 0)$?

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

2. A printer uses paper at a rate of 20 sheets per minute. How many hours would it take the printer to print a 5000-page document?

- A) $\frac{6}{25}$
- B) $4\frac{1}{6}$
- C) 25
- D) $41\frac{2}{3}$



3. The scatterplot above shows the number of nuclei left in several samples of a radioactive isotope based on the amount of time that has elapsed, in hours. Based on the data above, the relationship that exists between time elapsed and the number of nuclei left in a sample of the radioactive isotope can best be described as what?

- A) Positive and linear
- B) Positive and exponential
- C) Negative and linear
- D) Negative and exponential

4. A car traveled at an average speed of 55 miles per hour and consumed fuel at a rate of 26 miles per gallon. If the driver starts with a full 15-gallon fuel tank and wants to drive until his fuel tank is one-eighth full, approximately how long can he drive until he needs to stop to refuel?

- A) 53 minutes
- B) 3 hours and 28 minutes
- C) 6 hours and 12 minutes
- D) 7 hours and 6 minutes



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Question 5 refers to the following information.

A new country, which uses the U.S. dollar as currency, decides to tax the income of its citizens in the following way:

- The first \$20,000 of income is taxed at 16.6%
 - The next \$20,000 of income is taxed at 21.1%
 - All income over \$40,000 is taxed at 32.4%
5. If the income of a citizen of the new country increases from \$40,000 the first year to \$60,000 the next year, how much more will he be taxed the second year than the first year?
- A) \$3,320
B) \$6,480
C) \$11,000
D) \$11,900

Question 6 refers to the following information.

A survey of 268 children in the United States was conducted to gather data on their approval of a new game currently in beta testing. The data are shown in the table below.

	Rate favorably	Rate unfavorably	Total
5- to 8-year-olds	27	53	80
9- to 12-year-olds	48	27	75
13- to 15-year-olds	42	23	65
16- to 18-year-olds	16	32	48
Total	133	135	268

6. According to the table, for which age group did the greatest percentage of people rate the game favorably?
- A) 5- to 8-year-olds
B) 9- to 12-year-olds
C) 13- to 15-year-olds
D) 16- to 18-year-olds



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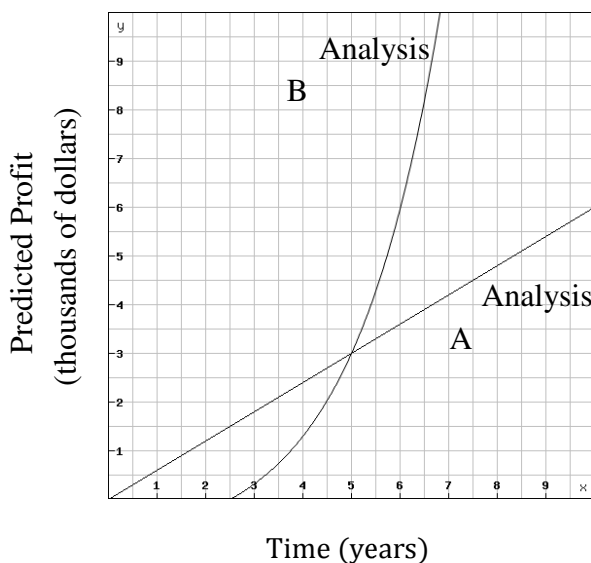
7. Maurice wants to decrease the concentration of a beaker of hydrogen peroxide and water by adding more water. Currently, the beaker contains 200 mL of liquid and is 2% hydrogen peroxide. How much water should he add to the beaker to reduce the contents of the beaker to 1.25% hydrogen peroxide?

- A) 47 mL
- B) 120 mL
- C) 152 mL
- D) 200 mL

$$h = v_0t - \frac{1}{2}gt^2$$

8. Based on the equation above, which of the following represents g in terms of h , v_0 , and t for all values of $t \neq 0$?

- A) $g = \frac{2v_0t - h}{t^2}$
- B) $g = \frac{2v_0t - 2h}{t^2}$
- C) $g = \frac{2h - v_0t}{t^2}$
- D) $g = \frac{2h - 2v_0t}{t^2}$



9. Two financial analysts created two different models of a company's predicted profits, as shown above. Which of the following is a correct statement about the data above?
- A) Analysis B predicts the company to not make any profit until 3 years later.
 - B) At 5 years, both analysts predict the same amount of profit for the company.
 - C) Analysis A offers a more reasonable prediction of the company's projected future profits.
 - D) Analysis B offers a more reasonable prediction of the company's projected future profits.



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10. The function f is defined by $f(x) = x^3 - ax^2 - 4x + 8$, where a is a constant. In the xy -plane, the graph of f intersects the x -axis at two points $(-2, 0)$ and $(b, 0)$. What is the value of $a + b$?

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




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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 $\frac{7}{2}$.



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

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

Write answer in boxes. →

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

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

Answer: 2.5

2	.	5	
.	.	.	.
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

← Decimal point

Grid in result. →

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

2	/	3	
.	.	.	.
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	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	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

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.



$$\frac{f-3}{-3} = 2 - 3f$$

$$\frac{3}{x} + \frac{1}{x} = \frac{2}{5}$$

11. What value of f satisfies the equation above?
12. Jackson needs to paint a bedroom and enlists his brother Percy for help. Percy can paint 3 bedrooms in x hours, while Jackson can paint 1 bedroom in x hours. Working together, the two brothers can paint two bedrooms in 5 hours. The equation above represents the situation described. What is the value of x , in hours?

STOP

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