

Math Test – No Calculator

25 MINUTES, 17 QUESTIONS

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

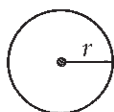
DIRECTIONS

For questions 1-13, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. For questions 14-17, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 14 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

NOTES

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

REFERENCE

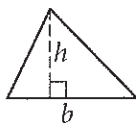


$$A = \pi r^2$$

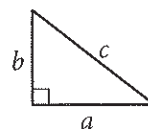
$$C = 2\pi r$$



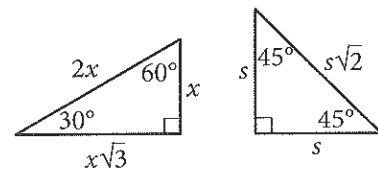
$$A = \ell w$$



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



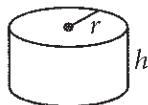
$$c^2 = a^2 + b^2$$



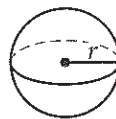
Special Right Triangles



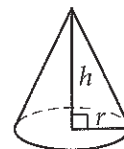
$$V = \ell wh$$



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



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



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



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

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

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

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



1

Normal body temperature for an adult is between 97.8°F and 99°F , inclusive. If Kevin, an adult male, has a body temperature that is considered to be normal, which of the following could be his body temperature?

- A) 96.7°F
- B) 97.6°F
- C) 97.9°F
- D) 99.7°F

2

A home builder purchased n pieces of lumber for a construction project. The type of lumber purchased cost $\$3.77$ per piece. If the builder was charged a onetime delivery fee of $\$65$, which of the following represents the total cost C , in dollars, for the purchase and delivery of the lumber?

- A) $C = 3.77n$
- B) $C = 68.77n$
- C) $C = 65n + 3.77$
- D) $C = 3.77n + 65$

3

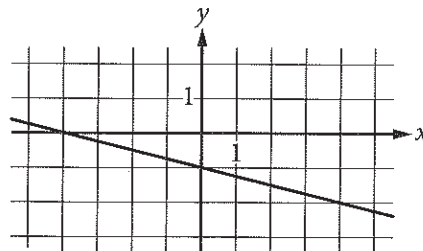
$$6m = 4m + 18$$

What value of m satisfies the equation above?

- A) 1.8
- B) 3
- C) 9
- D) 16

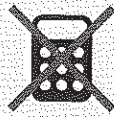
$$\begin{array}{r} 2m = 18 \\ \hline 2 \\ m = 9 \end{array}$$

4



Which of the following is an equation of the graph shown in the xy -plane above?

- A) $y = -\frac{1}{4}x - 1$
- B) $y = -x - 4$
- C) $y = -x - \frac{1}{4}$
- D) $y = -4x - 1$



5

Which of the following is equivalent to the expression $x^4 - x^2 - 6$?

- A) $(x^2 + 1)(x^2 - 6)$
 B) $(x^2 + 2)(x^2 - 3)$
 C) $(x^2 + 3)(x^2 - 2)$
 D) $(x^2 + 6)(x^2 - 1)$

$$(x^2 + 2)x^2$$

6

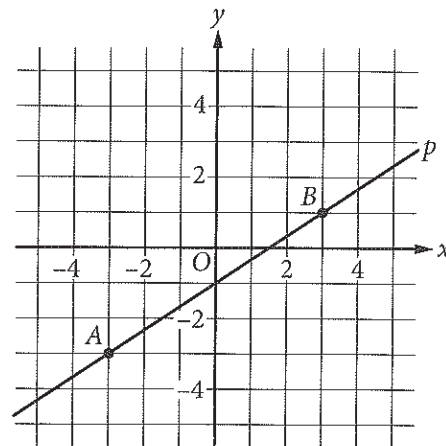
$$8x^2(-4x^5 + 3x + 1) + 2x^2$$

Which of the following is equivalent to the expression above?

- A) $-32x^{10} + 34x^2$
 B) $-32x^{10} + 26x^2 + 1$
 C) $-32x^7 + 24x^3 + 10x^2$
 D) $-32x^7 + 24x^3 + 16x^4 + 8x^2$

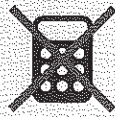
$$-32x^7 + 24x^3 + 16x^4 + 16x^2$$

7



Line p in the xy -plane above passes through points A and B . Line ℓ (not shown) has equation $y = ax + 6$ and has the same slope as line p . What is the value of a ?

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



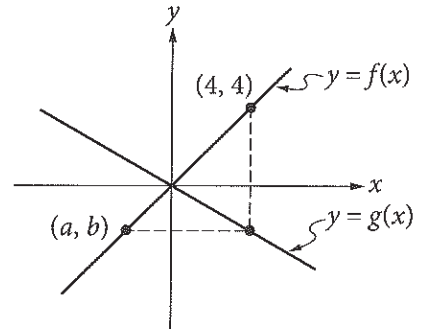
8

x	$f(x)$
0	5
1	$\frac{5}{2}$
2	$\frac{5}{4}$
3	$\frac{5}{8}$

The table above gives the values of the function f for some values of x . Which of the following equations could define f ?

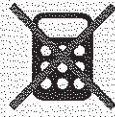
- A) $f(x) = 5(2^{x+1})$
- B) $f(x) = 5(2^x)$
- C) $f(x) = 5(2^{-(x+1)})$
- D) $f(x) = 5(2^{-x})$

9



The graphs of the functions f and g , defined by $f(x) = x$ and $g(x) = -\frac{1}{2}x$, are shown in the xy -plane above. If the vertical dashed line is parallel to the y -axis and the horizontal dashed line is parallel to the x -axis, what is the value of $a + b$?

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



10

The height, in feet, of an object x seconds after it is thrown straight up in the air can be modeled by the function $h(x) = -16x^2 + 20x + 5$. Based on the model, which of the following statements best interprets the equation $h(1.4) = 1.64$?

- A) The height of the object 1.4 seconds after being thrown straight up in the air is 1.64 feet.
- B) The height of the object 1.64 seconds after being thrown straight up in the air is 1.4 feet.
- C) The height of the object 1.64 seconds after being thrown straight up in the air is approximately 1.4 times as great as its initial height.
- D) The speed of the object 1.4 seconds after being thrown straight up in the air is approximately 1.64 feet per second.

11

$$x^2 - x - 1 = 0$$

What values satisfy the equation above?

- A) $x = 1$ and $x = 2$
- B) $x = -\frac{1}{2}$ and $x = \frac{3}{2}$
- C) $x = \frac{1 + \sqrt{5}}{2}$ and $x = \frac{1 - \sqrt{5}}{2}$
- D) $x = \frac{-1 + \sqrt{5}}{2}$ and $x = \frac{-1 - \sqrt{5}}{2}$

12

$$f(x) = -(x - 5)^2 + 10$$

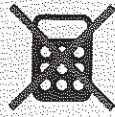
The quadratic function f is defined above. Which of the following best describes the point $(0, f(0))$ in the xy -plane?

- A) An x -intercept of the graph of f
- B) The y -intercept of the graph of f
- C) The vertex of the graph of f
- D) The origin

13


The function f is defined by $f(x) = 2b^x$, where b is a constant. The graph of f in the xy -plane passes through the point $(1, 1)$. What is the value of $f(-1)$?

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



DIRECTIONS

For questions 14-17, 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
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Grid in result.

Answer: 2.5

← Fraction line

	2	.	5	
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	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

← Decimal point

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

	2	/	3	
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	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	.	6	6	6
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

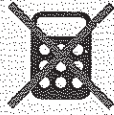
	.	6	6	7
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	0	0	0	
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2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Answer: 201 – either position is correct

	2	0	1	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
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3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	2	0	1	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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



14

$$\begin{aligned} 5x + 3y &= 38 \\ x + 3y &= 10 \end{aligned}$$

In the solution (x, y) to the system of equations above, what is the value of x ?

$$\begin{aligned} 5x + 3y + 3y &= 48 \\ 5x + 6y &= 48 \\ 6x + 6y &= 48 \\ x &= 8 \\ y &= 2 \end{aligned}$$

15

$$\frac{3\sqrt{x-6}}{-3} = \frac{12}{-3}$$

What is the value of x that satisfies the equation above?

$$\begin{aligned} x - 6 &= 9 \\ +6 & \quad +6 \\ x &= 15 \end{aligned}$$

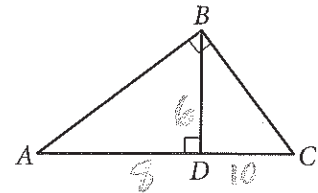
16

$$7x - 4 = 2(bx - 3)$$

In the equation above, b is a constant. For what value of b does the equation have no solution?

$$\begin{aligned} 7x - 4 &= 2bx - 6 \\ -2bx & \quad -2bx \\ 5bx - 4 &= -6 \\ +4 & \quad +4 \\ 5bx &= -2 \end{aligned}$$

17



Note: Figure not drawn to scale.

In the figure above, $BD = 6$ and $AD = 8$. What is the length of \overline{DC} ?

$$\begin{aligned} 6^2 + 8^2 &= c^2 \\ 36 + 64 &= c^2 \\ 100 &= c^2 \\ c &= \sqrt{100} = 10 \end{aligned}$$

$$1 = \frac{1}{2}(10) = 20$$

STOP

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

Do not turn to any other section.



Math Test – Calculator

45 MINUTES, 31 QUESTIONS

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

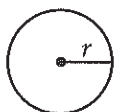
DIRECTIONS

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NOTES

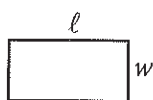
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- All figures lie in a plane unless otherwise indicated.
- Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



$$A = \pi r^2$$

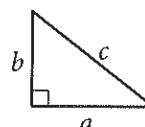
$$C = 2\pi r$$



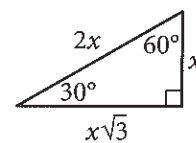
$$A = \ell w$$



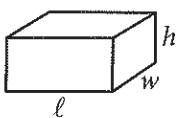
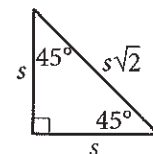
$$A = \frac{1}{2}bh$$



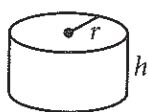
$$c^2 = a^2 + b^2$$



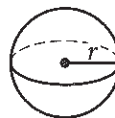
Special Right Triangles



$$V = \ell wh$$



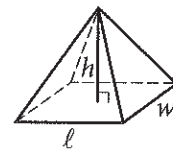
$$V = \pi r^2 h$$



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



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



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

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

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

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



1

If $(x + 5)^2 = 4$, which of the following is a possible value of x ?

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

$$\begin{array}{r} x+5 \quad x+5 \\ 2x+10=4 \\ -10 \quad -10 \\ \hline 2x = -6 \\ \quad 2 \\ \hline x = -3 \end{array}$$

2

If $5p + 10 = 20$, what is the value of $p + 2$?

- A) 2
B) 4
C) 5
D) 8

$$\begin{array}{r} 5p = 10 \\ \quad 5 \\ \hline p = 2 \end{array}$$

3

If $-6 + d = 18$, what is the value of $\frac{d}{8}$?

- A) $-\frac{3}{4}$
B) $\frac{3}{2}$
C) $\frac{9}{4}$
D) 3

$$\begin{array}{r} -6 + d = 18 \\ +6 \quad +6 \\ \hline d = 24 \end{array}$$

4

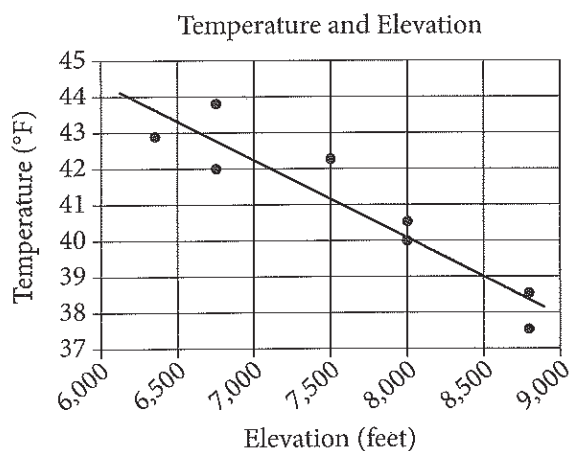
At a particular gas station, 3.25 gallons of gasoline costs \$8.45. At the same cost per gallon, what is the maximum number of gallons of gasoline that can be purchased for \$26?

- A) 2.6
B) 5.4
C) 10
D) 67.6

$$\begin{array}{r} 3.25 \times 8.45 = 26 \\ \quad - 8.45 - 8.45 \\ \hline 3.25g = 17.5 \\ \quad 3.25 \\ \hline g = 5.4 \end{array}$$



Questions 5-7 refer to the following information.



The scatterplot above shows the high temperature on a certain day and the elevation of 8 different locations in the Lake Tahoe Basin. A line of best fit for the data is also shown.

5

What temperature is predicted by the line of best fit for a location in the Lake Tahoe Basin with an elevation of 8,500 feet?

- A) 37°F
- B) 39°F
- C) 41°F
- D) 43°F

6

Which of the following statements best describes the association between the elevation and the temperature of locations in the Lake Tahoe Basin?

- A) As the elevation increases, the temperature tends to increase.
- B) As the elevation increases, the temperature tends to decrease.
- C) As the elevation decreases, the temperature tends to decrease.
- D) There is no association between the elevation and the temperature.

7

For the location with an elevation of 7,500 feet, which of the following is closest to the difference between the observed temperature and the temperature predicted by the line of best fit?

- A) 1°F
- B) 3°F
- C) 5°F
- D) 7°F



8

$$10 = 2x + 4$$

$$\begin{array}{r} 10 = 2x + 4 \\ -4 \quad -4 \\ \hline 6 = 2x \end{array}$$

$$\begin{array}{r} 6 = 2x \\ \div 2 \quad \div 2 \\ \hline 3 = x \end{array}$$

How many solutions exist to the equation shown above?

- A) None
- B) Exactly 1
- C) Exactly 3
- D) Infinitely many

9

$$4(x^2 - 3) - 2(x^2 + 5)$$

Which of the following is equivalent to the expression above?

- A) $2x^2 - 22$
- B) $2x^2 - 2$
- C) $2x^2 + 2$
- D) $2x^4 - 22$

$$\begin{array}{r} 4x^2 - 12 - 2x^2 - 10 \\ \hline 2x^2 - 22 \end{array}$$

10

Prices of 14 Different Cars

Type of car	Priced at no more than \$25,000	Priced greater than \$25,000	Total
Nonhybrid	5	3	8
Hybrid	2	4	6
Total	7	7	14

The table above shows information about 14 cars listed for sale on an auto dealership's website. If one of the cars listed for sale is selected at random, what is the probability that the car selected will be a hybrid car priced at no more than \$25,000?

- A) $\frac{1}{7}$
- B) $\frac{2}{7}$
- C) $\frac{1}{3}$
- D) $\frac{4}{7}$



Questions 11-13 refer to the following information.

A table of the US minimum wage for 6 different years is shown below.

Year	US minimum wage (dollars per hour)
1960	1.00
1970	1.60
1980	3.10
1990	3.80
2000	5.15
2010	7.25

11

In 1980, Amanda received the US minimum wage and was paid for 40 hours per week for 52 weeks. How much did Amanda receive in wages that year?

- A) \$124.00
 B) \$161.20
 C) \$4,960.00
 D) \$6,448.00

$$124 \times 52 = 6448$$

12

What was the percent increase of the minimum wage from 1960 to 1970?

- A) 30%
 B) 60%
 C) 62.5%
 D) 120%

13

What is the ratio of the minimum wage in 1970 to the minimum wage in 1990?

- A) 1:2
 B) 2:1
 C) 8:19
 D) 19:8

14

Nevaeh purchased some time to play a certain video game. When she had x minutes remaining to play, she purchased an additional 60 minutes. Then she played for another 54 minutes and stopped. Which of the following expressions represents the amount of time, in minutes, Nevaeh had left after she stopped?

- A) $x + 6$
 B) $x - 6$
 C) $x + 114$
 D) $114 - x$



15

A manufacturing company produces two sizes of cylindrical containers that each have a height of 50 centimeters. The radius of container A is 16 centimeters, and the radius of container B is 25% longer than the radius of container A. What is the volume, in cubic centimeters, of container B?

- A) $16,000\pi$
- B) $20,000\pi$
- C) $25,000\pi$
- D) $31,250\pi$

16

$$\begin{aligned}x + y &= 7 \\ y &= 2x + 4\end{aligned}$$

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

- A) -5
- B) -1
- C) 1
- D) 6

$$\begin{array}{r}7 = 2x + 4 \\ -4 \quad -4 \\ \hline 3 = 2x \\ \hline 2x\end{array}$$

17

During the first month of sales, a company sold 1,300,000 units of a certain type of smartphone. During the same month, 15% of the units sold were returned. If sales and the return rate remain the same for each of the next 5 months, about how many units of this smartphone will be returned to the company during this 6-month period?

- A) 195,000
- B) 975,000
- C) 1,170,000
- D) 6,630,000

18

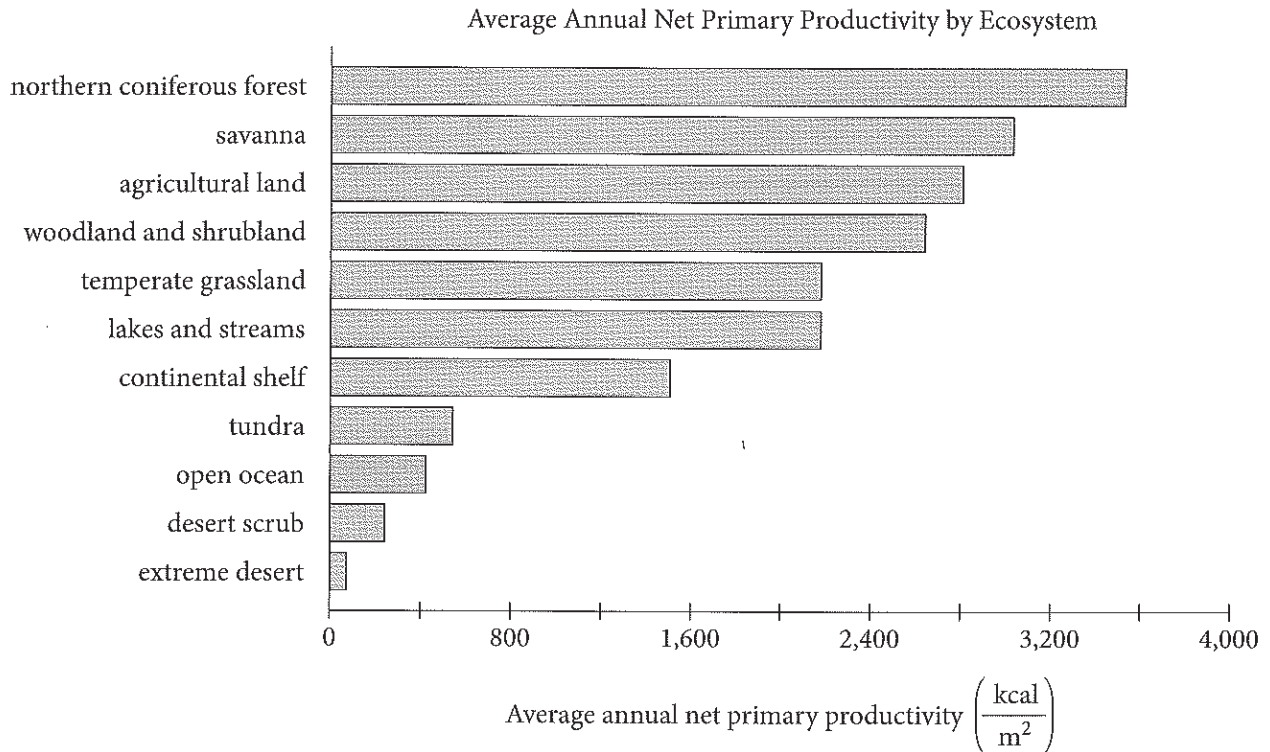
What is the slope of a line in the xy -plane that is perpendicular to the graph of the line that has

$$\text{equation } y = -\frac{1}{2}x + 3?$$

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



The figure below shows the average annual net primary productivity, in kilocalories per square meter $\left(\frac{\text{kcal}}{\text{m}^2}\right)$, for various types of ecosystems.

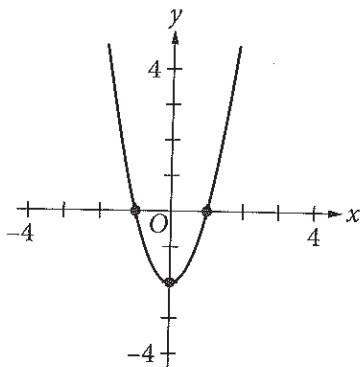


Based on the averages in the figure, over a three-year period, approximately how many more kilocalories will be produced by a square meter of northern coniferous forest than by a square meter of temperate grassland?

- A) 1,400
- B) 2,400
- C) 4,200
- D) 6,300



20



Which of the following equations could be represented by the graph in the xy -plane above?

- I. $y = 2x^2 - 2$
 - II. $y = 2(x - 1)^2$
 - III. $y = 2(x - 1)(x + 1)$
- A) I only
 B) III only
 C) I and III only
 D) I, II, and III

21

Employees working for a customer service line at an electric company recorded all the calls last Monday and noted whether the caller asked for repairs and whether the caller asked about a bill. The results are summarized in the table below.

	Asked for repairs	Did not ask for repairs	Total
Asked about a bill	48	623	671
Did not ask about a bill	130	90	220
Total	178	713	891

If a caller last Monday who asked about his or her bill is selected at random, which of the following is closest to the probability that the customer also asked for repairs?

- A) 0.05
 B) 0.07
 C) 0.20
 D) 0.27



22

The mean game attendance for a baseball team in the 2014 season was 36,500. The 2014 mean game attendance was 104% of the mean game attendance for the 2013 season. Which of the following is the best estimate of the mean game attendance for the baseball team in the 2013 season?

- A) 26,071
- B) 35,096
- C) 37,960
- D) 51,100

23

In North America, the standard width of a parking space is at least 7.5 feet and no more than 9.0 feet. A restaurant owner recently resurfaced the restaurant's parking lot and wants to determine the number of parking spaces, n , in the parking lot that could be placed perpendicular to a curb that is 135 feet long, based on the standard width of a parking space. Which of the following describes all the possible values of n ?

- A) $18 \leq n \leq 135$
- B) $7.5 \leq n \leq 9$
- C) $15 \leq n \leq 135$
- D) $15 \leq n \leq 18$

24

In physics, a particle of mass m moving at speed v has a wavelength λ , which can be calculated by the formula $\lambda = \frac{h}{mv}$, where h is a constant. If the speed of a particle is doubled and its mass remains the same, how will its wavelength change?

- A) It will remain the same.
- B) It will increase by 50%.
- C) It will increase by a factor of 2.
- D) It will decrease by a factor of 2.



25

Two different teams consisting of 10 members each ran in a race. Each member's completion time of the race was recorded. The mean of the completion times for each team was calculated and is shown below.

Team A: 3.41 minutes

Team B: 3.79 minutes

Which of the following **MUST** be true?

- I. Every member of team A completed the race in less time than any member of team B.
 - II. The median time it took the members of team B to complete the race is greater than the median time it took the members of team A to complete the race.
 - III. There is at least one member of team B who took more time to complete the race than some member of team A.
- A) III only
 B) I and III only
 C) II and III only
 D) I, II, and III

26

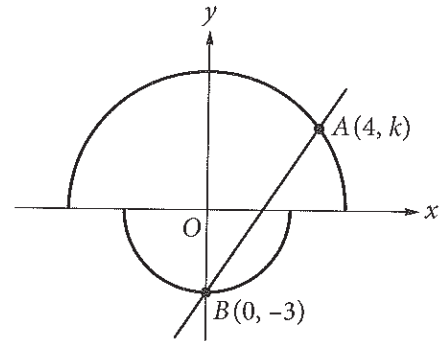
The equation $\frac{x^2 + 6x - 7}{x + 7} = ax + d$ is true for all

$x \neq -7$, where a and d are integers. What is the

value of $a + d$?

- A) -6
 B) -1
 C) 0
 D) 1

27



In the xy -plane above, point O is the center of both semicircles. The larger semicircle passes through point A and the point $(5, 0)$, and the smaller semicircle passes through point B . What is the slope of the line passing through points A and B ?

- A) $\frac{5}{4}$
 B) $\frac{4}{3}$
 C) $\frac{3}{2}$
 D) $\frac{7}{4}$



28

At a high school, the length of a class period is 40 minutes. What is the length, in hours, of a class period at the high school?

90

29

x	y
0	12
1	k

The values in the table above satisfy the equation $y = (x + p)(x + q)$, where k , p , and q are positive integer constants. What is a possible value for k ?



Questions 30 and 31 refer to the following information.

City	Number residing
Boston	17,300
Chicago	17,900
Detroit	14,900
Philadelphia	20,700
Houston	6,500
Los Angeles	18,900
Miami	20,800
New York City	63,000
Newark	17,300
San Francisco	13,800
Washington, DC	5,900
Total	217,000

The table above shows the number of Italian citizens who resided in eleven US cities on December 31, 2011.

30

The number of Italian citizens residing in Philadelphia on December 31, 2010, was 15% greater than the number of Italian citizens residing in Philadelphia on December 31, 2011. How many more Italian citizens were residing in Philadelphia on December 31, 2010, than on December 31, 2011?

31

If an Italian citizen residing in one of the eleven US cities on December 31, 2011, is selected at random, what is the probability that the citizen was residing in either Boston, Houston, or New York City? (Express your answer as a decimal or fraction, not as a percent.)

STOP

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