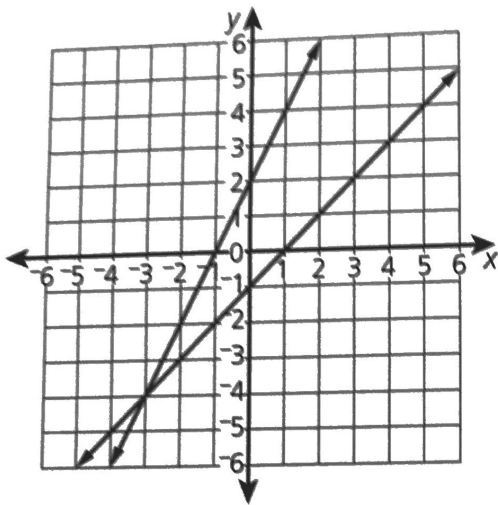**Directions: Read each problem. Then fill in the circle of the best answer.**

1 What is the value of $\frac{(7^2)(7^6)}{7^9}$?

Ⓐ $\frac{1}{7^3}$

Ⓑ $\frac{1}{7}$

Ⓒ 7

Ⓓ 7^3

**2** A system of equations is shown on this coordinate plane.

Which ordered pair represents the solution to this system of equations?

Ⓐ (-3, -4)

Ⓑ (-4, -3)

Ⓒ (-1, 0)

Ⓓ (0, -1)

3 What is the number 0.00000482 written in scientific notation?

Ⓐ 4.82×10^6

Ⓑ 4.82×10^5

Ⓒ 4.82×10^{-5}

Ⓓ 4.82×10^{-6}

4 Four athletes rode bikes and went swimming one day. The times each athlete did each activity are shown on the coordinate plane below.
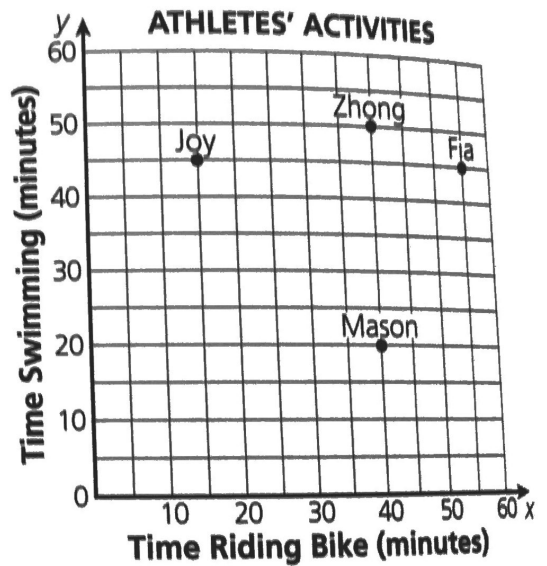
Which athlete appears to have the greatest difference between the two times?

Ⓐ Joy

Ⓑ Zhong

Ⓒ Fia

Ⓓ Mason

5 Look at the function table below.

x	y
2	7
4	11
6	15

What is the value of y when x is –2?

Ⓐ –7

Ⓑ –1

Ⓒ 3

Ⓓ 7

6 Which expression is equivalent to $(2^{-3})^3$?

Ⓐ -2^6

Ⓑ -2^9

Ⓒ $\dfrac{1}{2^6}$

Ⓓ $\dfrac{1}{2^9}$

7 Which of the following shows the graph of a linear function?

Ⓐ

Ⓑ

Ⓒ

Ⓓ
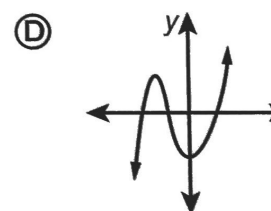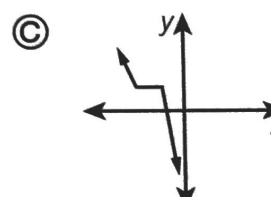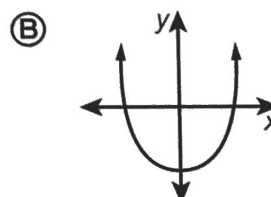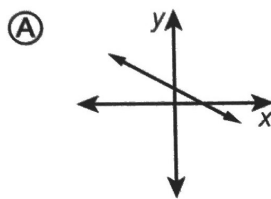
8 Figure FGHI is rotated 90° counterclockwise to form its image, as shown.
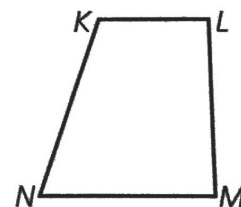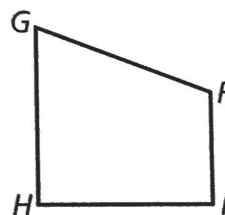
Which two sides must be congruent?

Ⓐ $\overline{GH}$ and $\overline{NM}$

Ⓑ $\overline{GH}$ and $\overline{LM}$

Ⓒ $\overline{HI}$ and $\overline{KL}$

Ⓓ $\overline{HI}$ and $\overline{NM}$

9 Look at triangle *ABC* on the coordinate plane below.
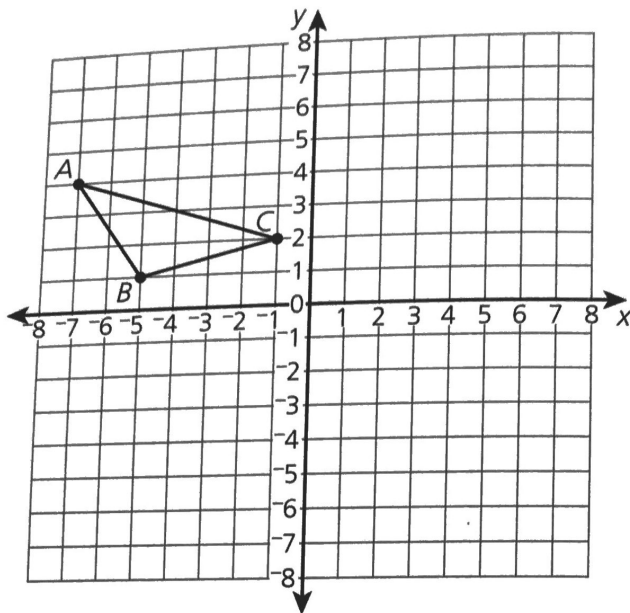
Triangle *ABC* will be reflected across the *y*-axis and translated 4 units down to form triangle *A'B'C'*. What will be the coordinates of point *C'*?

Ⓐ (1, 2)

Ⓑ (1, -2)

Ⓒ (-1, -2)

Ⓓ (-1, -4)

10 Light travels at a speed of approximately 300,000,000 meters per second. How is this number expressed in scientific notation?

Ⓐ 3×10^8

Ⓑ 3×10^9

Ⓒ 300×10^6

Ⓓ 300×10^9

11 What is the solution to the system of equations shown below?

$$\begin{cases} -2x + 4y = 0 \\ 2x - 4y = 0 \end{cases}$$

Ⓐ (2, 0)

Ⓑ (-2, 0)

Ⓒ There is no solution.

Ⓓ There are infinitely many solutions.

12 Which table of values represents a function?

Ⓐ

x	1	3	5	7	9
y	4	4	4	4	4

Ⓑ

x	0	3	5	3	7
y	0	1	2	3	4

Ⓒ

x	2	1	0	1	2
y	5	4	3	2	1

Ⓓ

x	3	3	3	3	3
y	4	6	8	10	12

13 Which of the following equations represents a linear function?

Ⓐ $y = \dfrac{1}{x - 1}$

Ⓑ $y = \dfrac{1}{2} - x$

Ⓒ $y = (x + 2)^2$

Ⓓ $y = \sqrt{x} - 2$

14 Which of the following situations can be modeled with a linear function?

- Ⓐ the area, y, of a square with side x
- Ⓑ the area, y, of a circle with radius x
- Ⓒ the volume, y, of a cube with an edge x
- Ⓓ the circumference, y, of a circle with radius x

15 Felicia leases a car. She pays $1,500 immediately and $175 each month. Which equation can be used to model the total dollar amount, d, Felicia pays for the car after m months?

- Ⓐ $d = 175m + 1,500$
- Ⓑ $m = 175d + 1,500$
- Ⓒ $d = 1,500m + 175$
- Ⓓ $m = 1,500d + 175$

16 Melanie surveyed 100 people who went to a movie yesterday. She recorded the time of day each person went to the movie and whether or not they bought a snack. Her results are shown in this two-way table.

MOVIE SURVEY

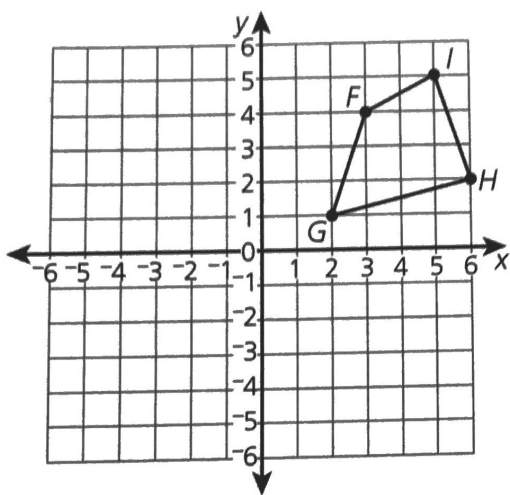| Time	Got a Snack	
	Yes	No
Day	14	26
Night	36	24

What is the relative frequency of people who saw a movie at night and got a snack to all people who saw a movie at night?

- Ⓐ 0.36
- Ⓑ 0.5
- Ⓒ 0.6
- Ⓓ 0.67

17 What is the value of $5^{-4} \div 5^{-1}$?

Ⓐ 20

Ⓑ 625

Ⓒ $\dfrac{1}{125}$

Ⓓ $\dfrac{1}{3,125}$

18 Kendra wants to create figure $F'G'H'I'$ so that it is congruent to figure $FGHI$ and completely in quadrant III of the coordinate plane below.

Which sequence will create figure $F'G'H'I'$ in the way Kendra wants it?

Ⓐ Reflect across the y-axis, then translate 6 units down.

Ⓑ Reflect across the x-axis, then rotate 180°.

Ⓒ Dilate by a scale factor of $\dfrac{1}{2}$ centered at the origin, then rotate 180°.

Ⓓ Translate 6 units down, then translate 3 units left.

19 The number of revolutions a gear makes is proportional to the number of minutes it revolves, as shown in this graph.
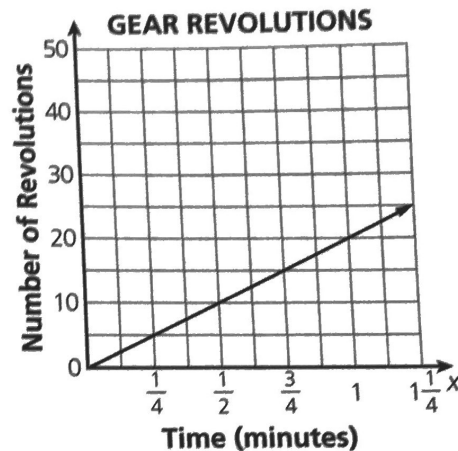
Which unit rate describes this relationship?

Ⓐ 10 revolutions per minute

Ⓑ 20 revolutions per minute

Ⓒ 25 revolutions per minute

Ⓓ 50 revolutions per minute

20 Which of the following relations is a linear function?

Ⓐ

x	y
2	4
2	3
2	4

Ⓑ

x	y
1	2
3	5
3	9

Ⓒ

x	y
2	7
4	7
6	7

Ⓓ

x	y
1	2
4	5
5	5

21 Look at the function table below.

x	y
-2	7
0	4
2	1
4	-2

What is the slope of the function?

Ⓐ $\frac{1}{2}$

Ⓑ $-\frac{3}{2}$

Ⓒ $\frac{5}{2}$

Ⓓ $-\frac{7}{2}$

22 Alex belongs to the fan club for his local baseball team. He pays a $20 membership fee each year and then is able to buy reduced tickets for $8 each. Dave does not belong to the fan club. He pays the full price of $12 for each ticket. How many games must Alex go to before he begins to save money?

Ⓐ 4

Ⓑ 5

Ⓒ 10

Ⓓ 60

23 A line contains the points (4, -2) and (-4, 2). Which equation can be used to find b, the value of the y-intercept of this equation?

Ⓐ $-2 = -2(4) + b$

Ⓑ $4 = -2(-2) + b$

Ⓒ $-2 = -\frac{1}{2}(4) + b$

Ⓓ $4 = -\frac{1}{2}(-2) + b$

24 A bowl is in the shape of a half sphere. The bowl has a diameter of 6 inches. Approximately how many cubic inches of space are inside the bowl?

Ⓐ 6π cubic inches

Ⓑ 12π cubic inches

Ⓒ 18π cubic inches

Ⓓ 36π cubic inches

25 Spartan Gym and Feel Great Fitness charge different monthly rates and different one-time membership fees. This system of equations represents the total cost, y, of each gym membership after x months.

Spartan Gym: $y = 40x + 50$
Feel Great Fitness: $y = 30x + 100$

Which statement about the costs of memberships at both gyms is true?

Ⓐ Spartan Gym always costs less than Feel Great Fitness.

Ⓑ Feel Great Fitness always costs less than Spartan Gym.

Ⓒ The cost of membership is the same at both gyms at 4 months.

Ⓓ The cost of membership is the same at both gyms at 5 months.

26 The largest continent has an area of approximately 4.5×10^7 square kilometers. The smallest continent has an area of approximately 7.7×10^6 square kilometers. What is the difference, in square kilometers, between the areas of these two continents?

Ⓐ 3.2×10^{-1} square kilometers

Ⓑ 3.2×10^1 square kilometers

Ⓒ 3.73×10^6 square kilometers

Ⓓ 3.73×10^7 square kilometers

27 A plastic cone is 9 centimeters tall and has a diameter of 6 centimeters. What is the approximate volume, in cubic centimeters, of the cone?

Ⓐ 18π cubic centimeters

Ⓑ 27π cubic centimeters

Ⓒ 54π cubic centimeters

Ⓓ 81π cubic centimeters

28 Matt is going to set the expression $6(x + 3)$ equal to another expression. Which expression would create an equation with infinitely many solutions?

Ⓐ $x + 18$

Ⓑ $6x + 3$

Ⓒ $3(x + 6)$

Ⓓ $6x + 18$

29 Gisa and Matilda are both saving money. This table shows the dollar amount, d, Gisa has saved after w weeks.

w	d
1	215
2	355
5	775
8	1,195

The function $d = 140w + 45$ represents the dollar amount, d, Matilda has saved after w weeks. Which statement is true?

Ⓐ Gisa saves less than Matilda each week.

Ⓑ Gisa saves more than Matilda each week.

Ⓒ Gisa and Matilda save the same amount each week.

Ⓓ Gisa and Matilda started with the same amount already saved.

30 What value of x makes this equation true?

$$-(x + 3) = 2(x - 3)$$

Ⓐ 0

Ⓑ 1

Ⓒ 2

Ⓓ 3