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$n$	1	2	3	4
$f(n)$	-2	1	4	7

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

- A)  $f(n) = n - 3$
- B)  $f(n) = 2n - 4$
- C)  $f(n) = 3n - 5$
- D)  $f(n) = 4n - 6$

16

If  $\frac{3}{5}w = \frac{4}{3}$ , what is the value of  $w$ ?

- A)  $\frac{9}{20}$
- B)  $\frac{4}{5}$
- C)  $\frac{5}{4}$
- D)  $\frac{20}{9}$

17

The average number of students per classroom at Central High School from 2000 to 2010 can be modeled by the equation  $y = 0.56x + 27.2$ , where  $x$  represents the number of years since 2000, and  $y$  represents the average number of students per classroom. Which of the following best describes the meaning of the number 0.56 in the equation?

- A) The total number of students at the school in 2000
- B) The average number of students per classroom in 2000
- C) The estimated increase in the average number of students per classroom each year.
- D) The estimated difference between the average number of students per classroom in 2010 and in 2000

18

The cost of using a telephone in a hotel meeting room is \$0.20 per minute. Which of the following equations represents the total cost  $c$ , in dollars, for  $h$  hours of phone use?

- A)  $c = 0.20(60h)$
- B)  $c = 0.20h + 60$
- C)  $c = \frac{60h}{0.20}$
- D)  $c = \frac{0.20h}{60}$

19

Line  $\ell$  in the  $xy$ -plane contains points from each of Quadrants II, III, and IV, but no points from Quadrant I. Which of the following must be true?

- A) The slope of line  $\ell$  is undefined.
- B) The slope of line  $\ell$  is zero.
- C) The slope of line  $\ell$  is positive.
- D) The slope of line  $\ell$  is negative.

20

The sum of three numbers is 855. One of the numbers,  $x$ , is 50% more than the sum of the other two numbers. What is the value of  $x$ ?

- A) 570
- B) 513
- C) 214
- D) 155

21

Mr. Kohl has a beaker containing  $n$  milliliters of solution to distribute to the students in his chemistry class. If he gives each student 3 milliliters of solution, he will have 5 milliliters left over. In order to give each student 4 milliliters of solution, he will need an additional 21 milliliters. How many students are in the class?

- A) 16
- B) 21
- C) 23
- D) 26

22

In the  $xy$ -plane, the line determined by the points  $(2, k)$  and  $(k, 32)$  passes through the origin. Which of the following could be the value of  $k$ ?

- A) 0
- B) 4
- C) 8
- D) 16

23

$$\begin{aligned} 3x + b &= 5x - 7 \\ 3y + c &= 5y - 7 \end{aligned}$$

In the equations above,  $b$  and  $c$  are constants.

If  $b$  is  $c$  minus  $\frac{1}{2}$ , which of the following is true?

- A)  $x$  is  $y$  minus  $\frac{1}{4}$ .
- B)  $x$  is  $y$  minus  $\frac{1}{2}$ .
- C)  $x$  is  $y$  minus 1.
- D)  $x$  is  $y$  plus  $\frac{1}{2}$ .

24

The monthly membership fee for an online television and movie service is \$9.80. The cost of viewing television shows online is included in the membership fee, but there is an additional fee of \$1.50 to rent each movie online. For one month, Jill's membership and movie rental fees were \$12.80. How many movies did Jill rent online that month?

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

25

One of the requirements for becoming a court reporter is the ability to type 225 words per minute. Donald can currently type 180 words per minute, and believes that with practice he can increase his typing speed by 5 words per minute each month. Which of the following represents the number of words per minute that Donald believes he will be able to type  $m$  months from now?

- A)  $5 + 180m$
- B)  $225 + 5m$
- C)  $180 + 5m$
- D)  $180 - 5m$

26

Last week Raul worked 11 more hours than Angelica. If they worked a combined total of 59 hours, how many hours did Angelica work last week?

- A) 24
- B) 35
- C) 40
- D) 48

- 27 Mr. Martinson is building a concrete patio in his backyard and deciding where to buy the materials and rent the tools needed for the project. The table below shows the materials' cost and daily rental costs for three different stores.

Store	Materials' Cost, $M$ (dollars)	Rental cost of wheelbarrow, $W$ (dollars per day)	Rental cost of concrete mixer, $K$ (dollars per day)
A	750	15	65
B	600	25	80
C	700	20	70

The total cost,  $y$ , for buying the materials and renting the tools in terms of the number of days,  $x$ , is given by  $y = M + (W + K)x$ .

For what number of days,  $x$ , will the total cost of buying the materials and renting the tools from Store B be less than or equal to the total cost of buying the materials and renting the tools from Store A?

- A)  $x \leq 6$   
 B)  $x \geq 6$   
 C)  $x \leq 7.3$   
 D)  $x \geq 7.3$

If the relationship between the total cost,  $y$ , of buying the materials and renting the tools at Store C and the number of days,  $x$ , for which the tools are rented is graphed in the  $xy$ -plane, what does the slope of the line represent?

- A) The total cost of the project  
 B) The total cost of the materials  
 C) The total daily cost of the project  
 D) The total daily rental costs of the tools

- 28 If  $3p - 2 \geq 1$ , what is the least possible value of  $3p + 2$ ?

- A) 5  
 B) 3  
 C) 2  
 D) 1

- 29 Let  $x$  and  $y$  be numbers such that  $-y < x < y$ . Which of the following must be true?

- I.  $|x| < y$   
 II.  $x > 0$   
 III.  $y > 0$

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

- 30 If  $x$  is the average (arithmetic mean) of  $m$  and 9,  $y$  is the average of  $2m$  and 15, and  $z$  is the average of  $3m$  and 18, what is the average of  $x$ ,  $y$ , and  $z$  in terms of  $m$ ?

- A)  $m + 6$   
 B)  $m + 7$   
 C)  $2m + 14$   
 D)  $3m + 21$

31

Tickets for a school talent show cost \$2 for students and \$3 for adults. If Chris spends at least \$11 but no more than \$14 on  $x$  student tickets and 1 adult ticket, what is one possible value of  $x$ ?

32

$$y \leq -15x + 3000$$

$$y \leq 5x$$

In the  $xy$ -plane, if a point with coordinates  $(a, b)$  lies in the solution set of the system of inequalities above, what is the maximum possible value of  $b$ ?

33

The normal systolic blood pressure  $P$ , in millimeters of mercury, for an adult male  $x$  years old can be modeled by the equation  $P = \frac{x + 220}{2}$ . According to the model, for every increase of 1 year in age, by how many millimeters of mercury will the normal systolic blood pressure for an adult male increase?

34

In a study of bat migration habits, 240 male bats and 160 female bats have been tagged. If 100 more female bats are tagged, how many more male bats must be tagged so that  $\frac{3}{5}$  of the total number of bats in the study are male?