

Name \_\_\_\_\_

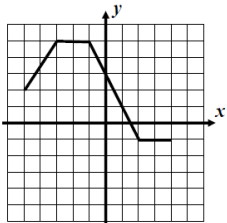
1 For the piecewise defined function  $f(x) = \begin{cases} 3x-1 & x < 3 \\ \frac{1}{2}x+7 & x \geq 3 \end{cases}$ , which of the following is the value of  $f(6)$ ?

- (1) 7
- (2) 10
- (3) 17
- (4) 27

2 If  $f(x) = x^2 - 2x - 11$ , then which of the following values of  $x$  solves  $f(x) = 4$ ?

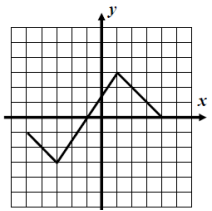
- (1)  $x = 0$
- (2)  $x = -2$
- (3)  $x = 3$
- (4)  $x = 5$

3 The function  $f(x)$  is shown graphed below. The function  $g$  is defined by the formula  $g(x) = 3f(x) - 2$  for all values of  $x$  in the domain of  $f$ . Which of the following is the value of  $g(2)$ ?



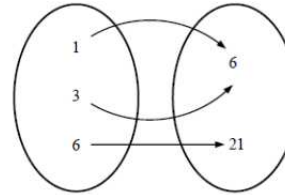
- (1) -5
- (2) -1
- (3) 3
- (4) 4

4 Given the graph of  $h(x)$  shown below, over which of the following intervals is  $h$  increasing?

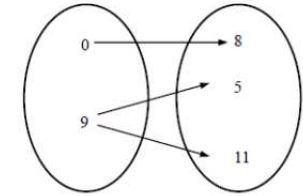


- (1)  $-1 < x < 4$
- (2)  $-3 < x < 1$
- (3)  $-3 < x < 3$
- (4)  $1 < x < 4$

5 The two diagrams below show how elements of a domain get changed into elements of a range. In one case, this represents a function. In the other case, it does not. Explain which is a function and which is not. Fully explain your choices.



Case #1



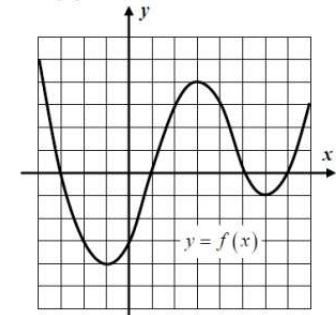
Case #2

6

For the function  $y = f(x)$  shown graphed below, answer the following questions.

(a) Find the value of  $f(3) + f(6)$ .

(b) State all intervals over which  $f(x) < 0$ .



(c) Solve the equation  $f(x) = 0$  for all value(s) of  $x$ . Circle the points on your graph that you use to find your solutions.

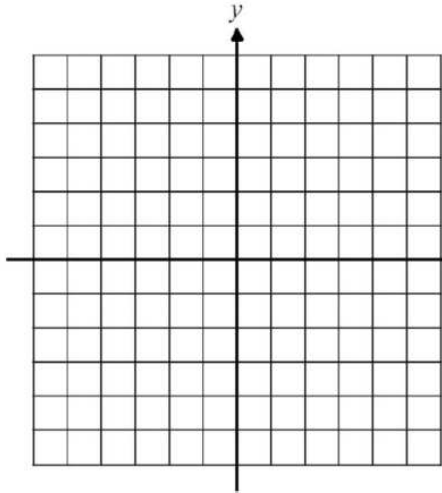
(d) Give an interval over which  $f(x)$  is *only* decreasing.

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Given the piecewise function  $f(x) = \begin{cases} 3x + 11 & -5 \leq x \leq -2 \\ -\frac{1}{2}x + 5 & -2 < x \leq 4 \end{cases}$

**7**

(a) Graph this function on the grid to the right. Show your table of values.



(b) State the range of this function.

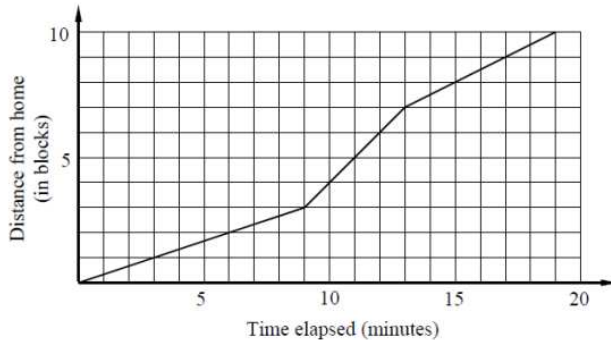
**8**

Michael is walking from home to a subway stop that is 10 blocks away. Calculate Michael's average rate of change, in blocks per minute, for each of the following intervals:

0 to 9 minutes

9 to 13 minutes

13 to 19 minutes



During which interval is Michael moving the slowest?

**9**

The table below is partially filled out for the function  $f(x) = x^2 - 3x - 4$ .

$x$	-3	-2	-1	0	1	2	3	4	5
$f(x)$	14			-4		-6			6

(a) Fill out the remaining portions of the table.

(b) State the zeroes of the function.

(c) What is the maximum value of  $f$  on this interval?

**10**

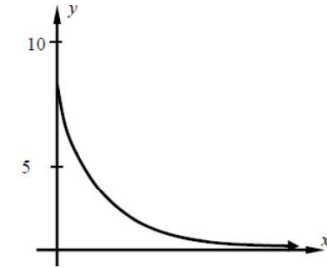
Which of the following could be the equation of the exponential function shown below?

(1)  $y = 3(0.9)^x$

(2)  $y = 7(1.2)^x$

(3)  $y = 8(0.5)^x$

(4)  $y = 4(2.5)^x$



**11**

A population of bacteria is increasing at a rate of 7.5% per hour. If there were originally 275 bacteria, which of the following equations models the population of bacteria  $h$ -hours after the original 275 bacteria were measured?

(1)  $P = 275(7.5)^h$

(3)  $P = 1.075h + 275$

(2)  $P = 7.5(275)^h$

(4)  $P = 275(1.075)^h$

**12**

If the first two terms of a geometric sequence are 4 and 12, which of the following would be the 10th term?

(1) 76

(3) 78,732

(2) 84

(4) 236,196