

Name: \_\_\_\_\_

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**UNIT #4 – LINEAR FUNCTIONS AND ARITHMETIC SEQUENCES**  
**REVIEW QUESTIONS**

**Part I Questions**

1. Carly walks 30 feet in seven seconds. At this rate, how many minutes will it take for Carly to walk a mile if there are 5,280 feet in one mile?

(1) 17.3 minutes                      (3) 20.5 minutes

(2) 12.8 minutes                      (4) 27.8 minutes

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2. Which of the following points lies on the graph of the line  $y = 5x - 2$ ?

(1) (0, 4)                              (3) (-1, 2)

(2) (2, 8)                              (4) (4, 10)

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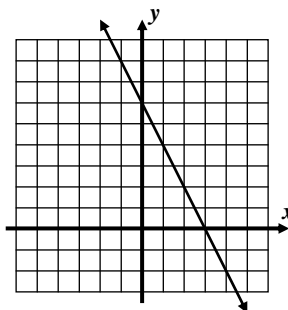
3. Which of the following is the equation of the line shown graphed below?

(1)  $y = \frac{1}{2}x + 3$

(2)  $y = -3x + 4$

(3)  $y = 6x - 2$

(4)  $y = -2x + 6$



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4. A cell phone plan charges a flat monthly fee of \$15.25 and an additional \$0.07 per hour spent talking on the phone. Which of the following functions gives the cost,  $c$ , of the cell phone plan as a function of the number of hours,  $h$ , spent talking?

(1)  $c = .07h + 15.25$                       (3)  $c = .07(h + 15.25)$

(2)  $c = 15.25h + .07$                       (4)  $c = 15.25(h + .07)$

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5. Which of the following is the slope of the line that passes through the points  $(-3, 5)$  and  $(1, 15)$

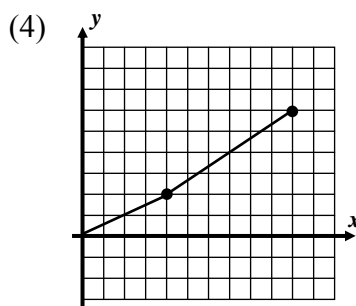
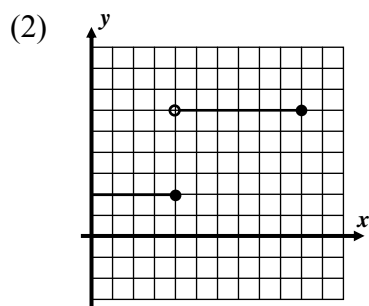
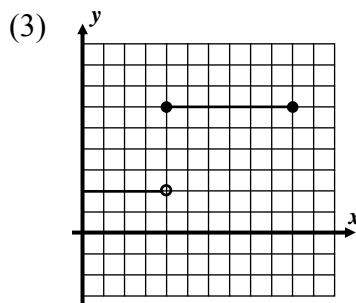
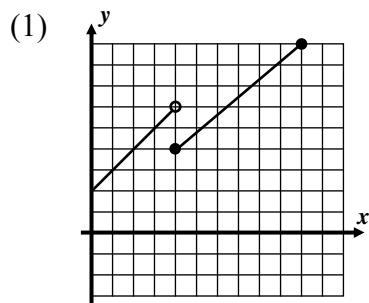
(1) 5                                      (3)  $\frac{7}{3}$

(2) -3                                      (4)  $\frac{5}{2}$

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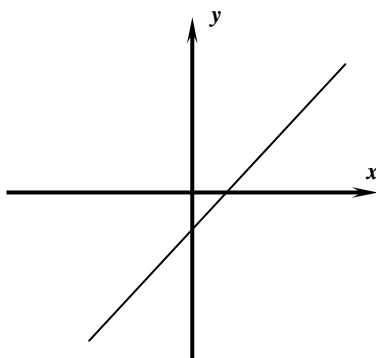
6. The function  $f(x) = \begin{cases} 2 & 0 \leq x \leq 4 \\ 6 & 4 < x \leq 10 \end{cases}$  is shown graphed in which choice below?



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7. Which equation below could describe the graph shown?

- (1)  $y = 2x + 4$   
 (2)  $y = -5x + 3$   
 (3)  $y = x - 2$   
 (4)  $y = -\frac{1}{2}x - 1$



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8. Which point is a solution to the system of equations shown below?

- |            |            |               |
|------------|------------|---------------|
| (1) (3, 7) | (3) (1, 5) | $y = 4x - 5$  |
| (2) (0, 1) | (4) (2, 3) | $y = -2x + 7$ |

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9. If  $f(1) = 8$  and  $f(n) = \frac{1}{2}f(n-1) + 2$  then which of the following is the value of  $f(3)$ ?

- (1) 5  
 (2) 7  
 (3) 3  
 (4) 6

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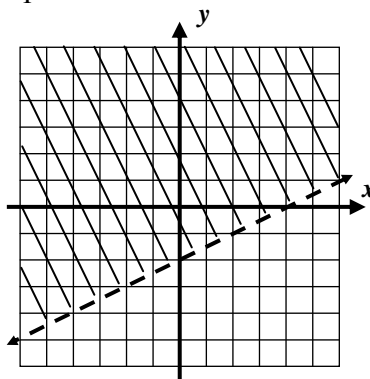


10. The first two terms of an arithmetic sequence are 6 and 11, respectively. Which of the following represents the 14<sup>th</sup> term of the sequence?

- (1) 71                              (3) 76  
(2) 66                              (4) 61

11. Which of the following inequalities is shown graphed below?

- (1)  $y < 2x - 2$   
(2)  $y > \frac{1}{2}x - 2$   
(3)  $y \geq \frac{1}{2}x + 4$   
(4)  $y \leq 2x + 4$



12. If  $f(x) = |x - 3| + 7$ , then which of the following is the value of  $f(1)$ ?

- (1) 11                              (3) 9  
(2) 13                              (4) 17

13. If a line is drawn parallel to the y-axis through the point  $(4, 2)$ , then its equation would be

- (1)  $y = x + 2$                       (3)  $y = 4x + 2$   
(2)  $y = 2$                               (4)  $x = 4$

14. A line with a slope of 5 passes through the point  $(3, 8)$ . Which of the following is the value of its y-intercept?

- (1) -7                              (3) 8  
(2) -1                              (4) 15

15. In order to convert 3.6 meters into yards, Evin used the following product:

$$3.6 \text{ meters} \times \frac{100 \text{ centimeters}}{1 \text{ meter}} \times \frac{2.54 \text{ centimeters}}{1 \text{ inch}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \times \frac{1 \text{ yard}}{3 \text{ feet}}$$

Which of the following ratios was written incorrectly in this conversion process?

- (1)  $\frac{100 \text{ centimeters}}{1 \text{ meter}}$                       (3)  $\frac{1 \text{ foot}}{12 \text{ inches}}$



$$(2) \frac{2.54 \text{ centimeters}}{1 \text{ inch}}$$

$$(4) \frac{1 \text{ yard}}{3 \text{ feet}}$$

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### Free Response Questions

16. Write the equation of the line, in  $y = mx + b$  form, that passes through the points  $(-2, -15)$  and  $(5, 13)$ . Show how you arrived at the values of  $m$  and  $b$ .

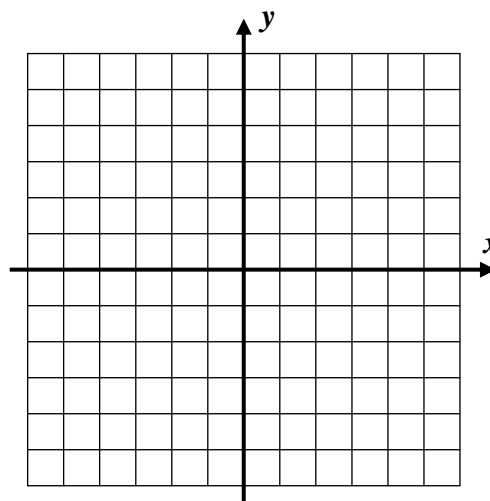
17. Graph each of the following lines on the grid below. Label each with its equations.

$$y = x - 2$$

$$2y + 3x = 4$$

$$y = -4$$

$$x = -2$$



18. Show that the point  $(4, 11)$  is a solution to the system shown below.

$$y = x + 7 \quad \text{and} \quad y < 4x - 2$$

19. Given the arithmetic sequence shown below, write a recursive rule for the sequence.

$$-4, 4, 12, 20, \dots$$



20. People are entering a stadium at a steady rate of 32 people per minute. When the gates open, there are already 46 people in the stadium. No one leaves the stadium for the first hour after the gates have opened.

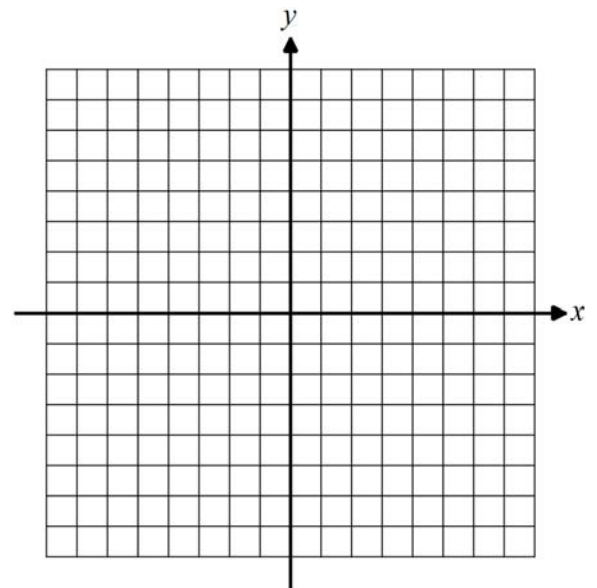
(a) How many people will be in the stadium 30 minutes after it opens? Show the calculations that lead to your answer.

(b) Write a linear equation for the number of people,  $n$ , as a function of the time in minutes,  $m$ , since the gates were opened.

(c) After one hour, no additional people enter, but some start to leave. If it takes them a total of 4 hours to leave the stadium, what is the average rate at which they leave, in people per hour? Show the calculations that lead to your answer.

21. Graph the function  $f(x) = |x - 2| - 3$  on the interval  $-6 \leq x \leq 6$  on the grid below.

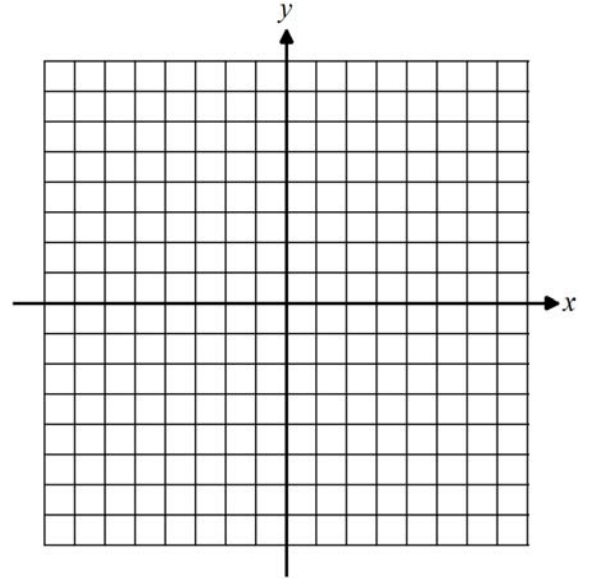
What is the range of this function over this domain interval?



22. A sequence is defined by the recursive formula  $a_1 = -6$  and  $a_n = a_{n-1} + 2n$ . Write out the next three terms of this sequence. Show the work that leads to your terms.



23. Graph the linear inequality  $2x - 5y > -15$  on the grid below. State one point that lies in its solution set.



24. Consider the function  $f(x) = \text{round}(x)$ , where  $\text{round}(x)$  rounds the input,  $x$ , to the nearest integer.

(a) Evaluate each of the following:

$$f(1.7) =$$

$$f(0.27) =$$

$$f(2.5) =$$

(b) Explain why the value 2.7 could *not* be part of the range of this function.

(c) Graph the function on the grid below for all values of  $x$  in the interval  $0 \leq x \leq 6$

