

**Pre-Algebra, Unit 6 Practice Test:**  
**Use Functions to Model Relationships between Quantities**

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

Date: \_\_\_\_\_

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1. When modeling linear relationships between quantities using a function, we can determine the rate of change by finding the \_\_\_\_\_ of its graph.
2. In order to find the initial value of a function we can simply look at the \_\_\_\_\_ of the graph.
3. Describe how to determine whether a function is linear or non-linear.

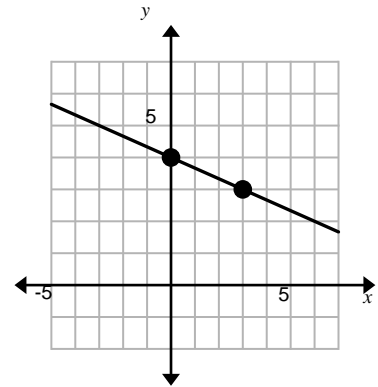
4. (SBAC F4) This table of values represents a linear function.

Write an equation in the form  $y = mx + b$  that represents the function defined by this table of values.

$x$	$y$
-2	-3
1	3
3	7

5. (SBAC F4) This graph represents a linear function.

Write an equation in the form  $y = mx + b$  that represents the function defined by this graph.



6. (SBAC F4) This table shows the linear relationship between the water level in a tank and the amount of time elapsed.

Determine the rate of change of the water level, in feet per hour.

Time (hr)	Water Level (ft)
0	100
2	90
4	80
6	70

7. (SBAC F4) A water tank with 10,000 gallons of water is being steadily drained of water at a rate of 600 gallons every 3 hours. Write an equation in the form  $y = mx + b$  that represents the amount of water ( $y$ ), in gallons, remaining in the tank after  $x$  hours.

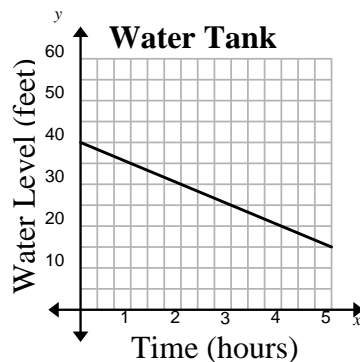
Equation: \_\_\_\_\_

Determine whether or not each statement about the amount of water in the tank is true. Select True or False for each statement.

Statement	True	False
The amount of water in the tank decreases by 200 gallons every 1 hour.		
The amount of water remaining in the tank after 3 hours is 600 gallons.		
The initial amount of water in the tank is 10,000 gallons		

8. This graph shows a linear relationship between the water level in a tank and time elapsed.

Enter the initial water level, in feet, of the water tank.



9. Write the equation below in slope-intercept form. Show your steps.  
 $x + 4y = 8$

10. Identify the slope and the  $y$ -intercept of the line with the given equation:

$$2x + 6y = 12$$

- A. Slope is  $-\frac{1}{3}$ ;  $y$ -intercept is 2  
 B. Slope is  $-\frac{1}{3}$ ;  $y$ -intercept is  $-2$   
 C. Slope is  $-3$ ;  $y$ -intercept is  $-2$   
 D. Slope is  $-3$ ;  $y$ -intercept is 2
11. (SE F4) Adam owes his parents \$420 and agrees to pay them back an equal amount each month without interest. After 3 months he still owes his parents \$270. Choose the linear function that models the amount that Adam owes his parents each month since he borrowed the money.

- A.  $y = 420 - 50x$   
 B.  $y = 420 - 150x$   
 C.  $y = 270 - 50x$   
 D.  $y = 270 - 150x$

12. (SE F4) This table shows points on a line. What are the y-intercept and rate of change of the line?

$x$	5	2	-1	-6	-7
$y$	-16	-4	8	28	32

- A. y-intercept = 1  
Rate of change =  $-4$
- B. y-intercept = 4  
Rate of change =  $-4$
- C. y-intercept = 1  
Rate of change =  $-\frac{1}{4}$
- D. y-intercept = 4  
Rate of change =  $-\frac{1}{4}$

13. (SE F3) Which of the following represents a linear function?

I. 

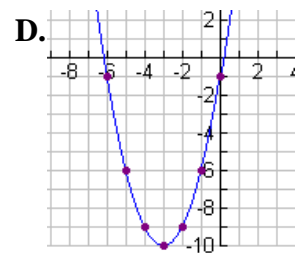
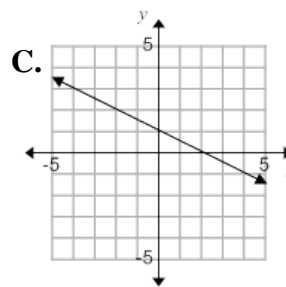
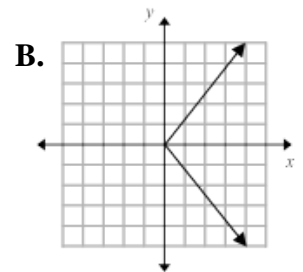
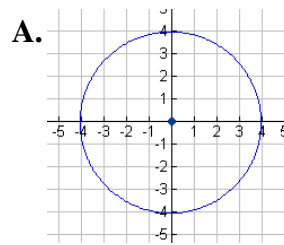
$x$	-2	-1	0	1	2
$y$	4	1	-1	0	1

II.  $y = 3x$

III.  $\{(-1, 7), (0, 6), (1, 5), (2, 4)\}$

- A. I only
- B. II only
- C. II and III
- D. I and III

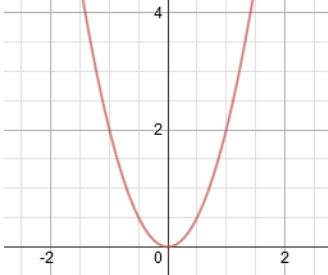
14. (SE F3) Which graph below represents a linear function?



15. What type of function is  $y + 3 = 4x$ ? Explain.

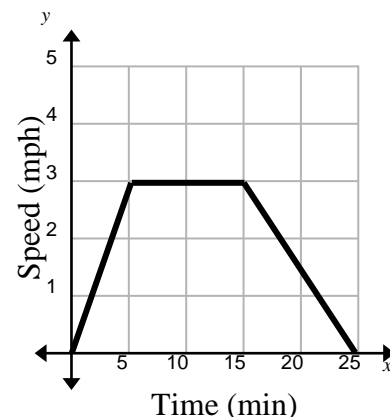
- A. The function is NOT linear because it is written in the form  $y + b = mx$
- B. The function is NOT linear because it is not written in the form  $y = mx + b$
- C. The function is linear because it can be written in the form  $y = mx + b$ :  
 $y = 3x - 4$
- D. The function is linear because it can be written in the form  $y = mx + b$ :  
 $y = 4x - 3$

16. (SBAC F3) Determine whether each relation is linear or nonlinear. Put an X in the correct column.

Function		Linear	Nonlinear									
<table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>8</td> </tr> <tr> <td>0</td> <td>4</td> </tr> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>-4</td> </tr> </tbody> </table>	x	y	-1	8	0	4	1	0	2	-4		
x	y											
-1	8											
0	4											
1	0											
2	-4											
$\{(3, 2), (2, 3), (2, 4), (3, 5)\}$												
$y = -\frac{2}{3}x + 2$												
												

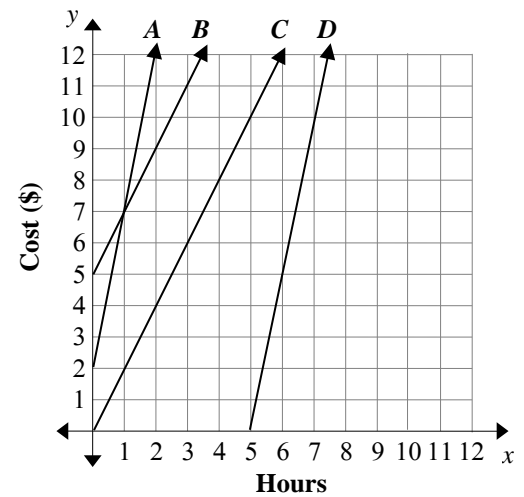
17. (SE F5) The graph shows the walking speed of a person on a treadmill. For how minutes was the person's speed increasing?

- A. 5 minutes
- B. 10 minutes
- C. 15 minutes
- D. 25 minutes

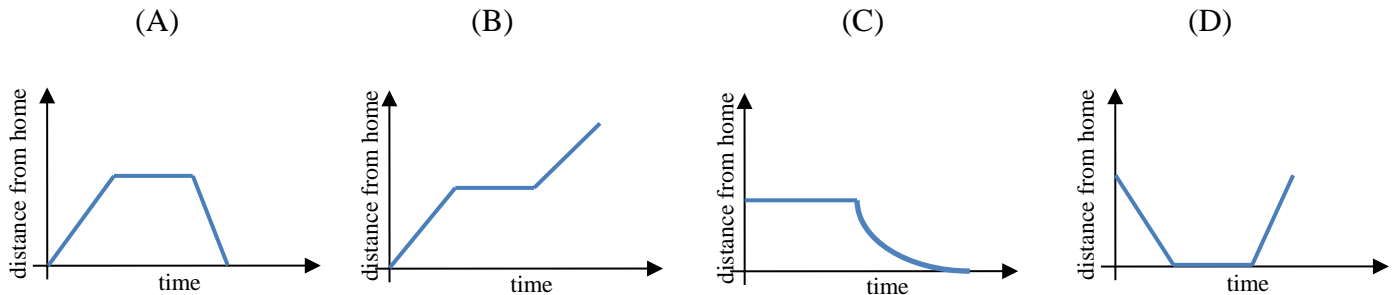


18. (SE F5) A skate park charges an initial rental fee of \$2 plus an additional \$5 for each hour of use. Which line best represents the total cost of renting the skateboard?

- A. line A
- B. line B
- C. line C
- D. line D



19. (SE F5) Kobe started from school and walked home. He stayed at home for a while and then ran back to school for basketball practice. Which graph best shows this situation?



20. (SBAC F5) Jason's house is 200 yards from school. He made the following trip:

- He walked 100 yards toward school in 3 minutes. He realized he left his math homework at home,
- So he turned around and walked home at the same speed.
- He spent 1 minute looking for his homework.
- He walked all the way to school at twice his original speed.

Draw a graph that represents Jason's trip over time.

