P.S. #8.2 - Linear and Nonlinear Functions

Name: _____ Class: _____

Tell whether each table of values represents a linear or nonlinear function.

1.)

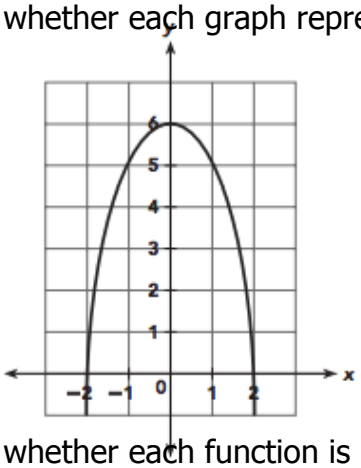
x	1	3	5	7
y	2	18	50	98

2.)

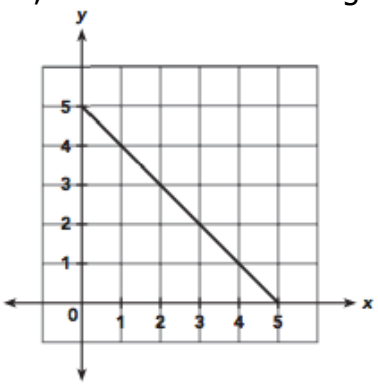
x	−1	3	7	11
y	−4	8	20	32

Tell whether each graph represents a linear function. If so, find the rate of change.

3.)

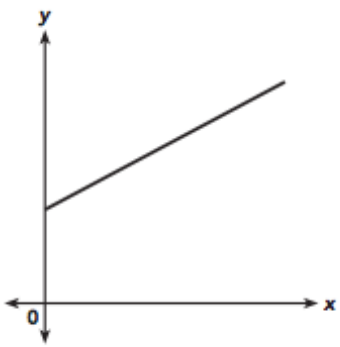


4.)



Tell whether each function is linear or nonlinear. Then tell whether the function is increasing or decreasing.

5.)



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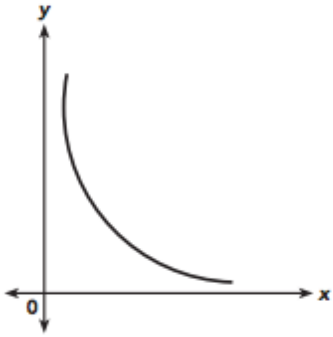

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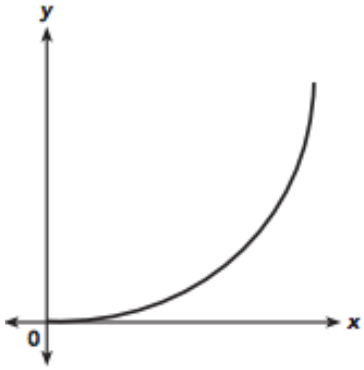

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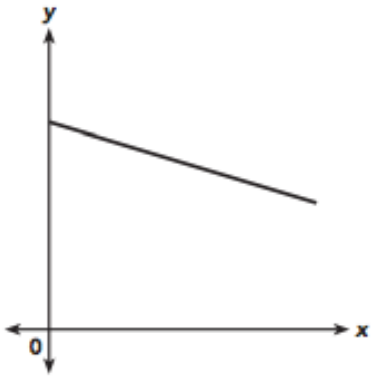
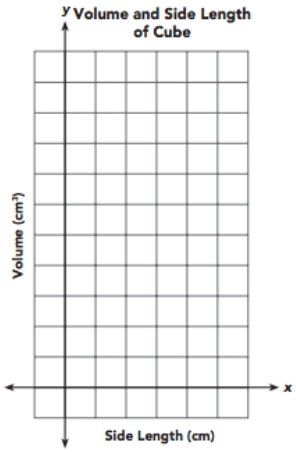


9.) The table shows the volume of a cube, V cubic centimeters, as a function of its side length, x centimeters.

Input, Side Length (x centimeters)	0	1	2	3	4
Output, Volume (V cubic centimeters)	0	1	8	27	64

a.) Tell whether the function is linear or nonlinear. Then tell whether the function is increasing or decreasing. Explain.

b.) Graph the table of values.



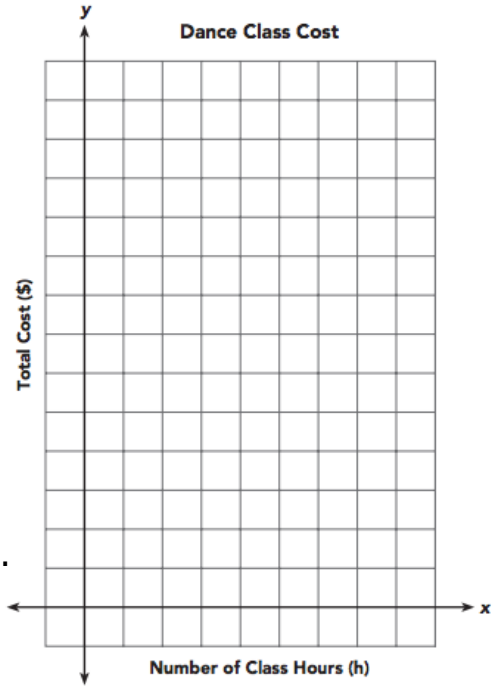
10.) A dancing studio charges a $35 registration fee for class enrollment plus a per class fee. The dance class Danielle plans to take is $70 per hour. The table shows the total cost, y dollars, as a function of the number of class hours, x.

Number of Class Hours (x)	0	1	2	3	4	5	6
Total Cost ($)	35	105	175	245	315	385	455

a.) Graph the information on the graph at the right.

b.) Find the slope of the function. **Include proper units.**

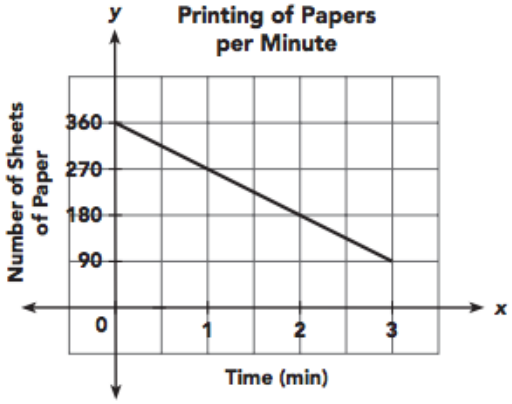
c.) Find the y-intercept of the function. Interpret its meaning.



d.) Write an equation that represents the total cost, y dollars, as a function of the number of class hours, x.

11.) The graph shows the number of sheets of paper, *y*, remaining in the input paper tray of a photocopy machine as a function of the time the machine is operational, *x* minutes.

a.) Write an equation in slope-intercept form to represent the function.



b.) What information do the values for slope and y-intercept give you about the function?

12.) Which equation does **not** represent a linear function of x?

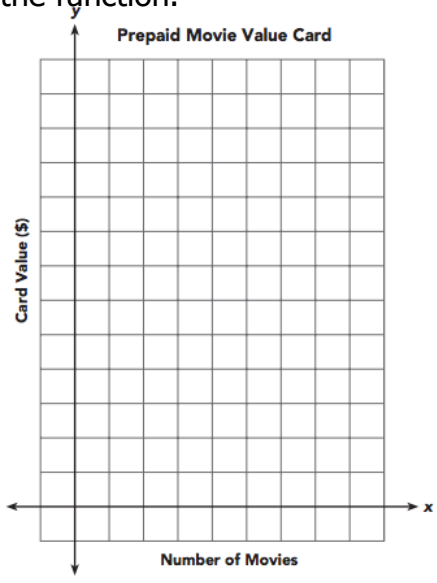
(A) $y = -\frac{2}{3}x$ (B) $y = 2x^2 + 5$ (C) $y = -5 + 3x$ (D) $y = \frac{x}{3}$

13.) Nicole had a prepaid movie card with a value of $45. Every time she watches a movie, $7.50 is deducted from the value of her card. The amount of money remaining on her card, *y* dollars, is a function of the number of movies she watches, *x*.

a.) Write an algebraic equation for the function.

b.) Construct a table of x and y values for the function. Use values of x from 0 to 6. Use the table of values to plot a graph to represent the function.

x	y
1	
2	
3	
4	
5	
6	



State whether the given functions are linear or nonlinear. If it is linear, state the slope and y-intercept. If it is nonlinear, explain why.

Function	*Linear/Nonlinear*	*If linear: slope and y-intercept* *If nonlinear: explain why*
14.) $y = -6x + 8$		
15.) $y = 3x^2 - 1$		
16.) $y = 1 - \frac{3}{5}x$		
17.) $y = 3.2$		
18.) $y = \frac{x^3}{2} + 9x$		
19.) $y = 6x - \frac{2}{5}$		
20.) $3x + 2y = 7$		
21.) $\frac{3}{x} = y$		
22.) $9x - 2 = \frac{y}{2}$		

23.) Evaluate:

$$(3.5 \times 10^5)(8.2 \times 10^3)$$

(A) 2.87×10^8 (C) 2.87×10^9

(B) 2.87×10^{15} (D) 2.87×10^{16}

24.) Solve the equation below for d.

$$0.1(4d - 24) = 0.6d + 10 - 6 + 0.2d$$