

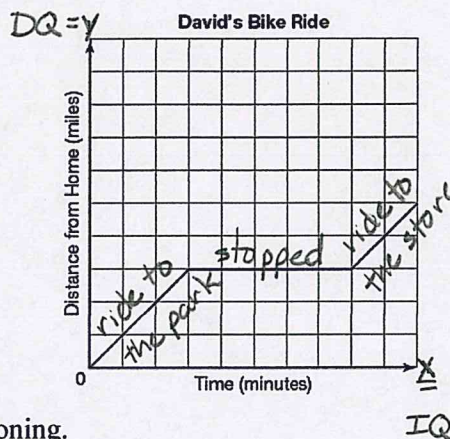
**COMPLETE EVERY PROBLEM SHOW ALL WORK FOR 5% BONUS!**

1. Hector knows there is a relationship between the **number of cars** he washes and the **time** it takes to wash those cars. Identify the independent quantity and the dependent quantity in the problem situation.

*IQ = time      DQ = number of cars washed*

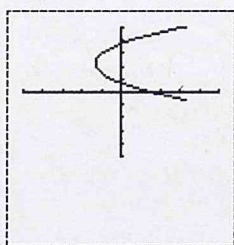
2. David rode his bike to the park. He stopped to watch the other children play for a few minutes, then continued his ride to the grocery store. The graph shows this relationship. **What is the independent quantity and dependent quantity?**

*IQ = time  
DQ = distance from home*



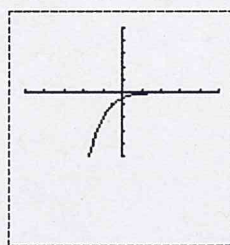
3. Determine whether each graph represents a function. Explain your reasoning.

1. Circle one: Yes or **(No)**

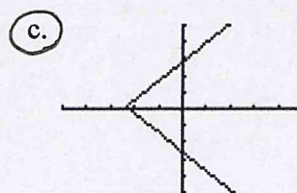
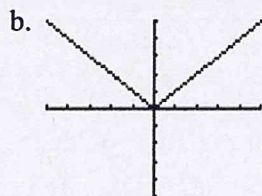
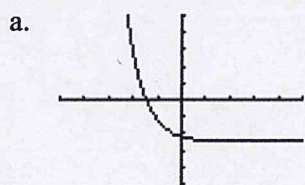


*Fails the vertical line test*

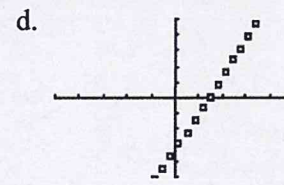
b. Circle one: **(Yes)** or No



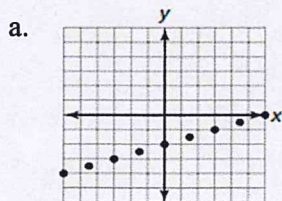
4. Which graph does **NOT** represent a function?



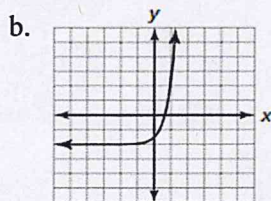
*Fails the vertical line test*



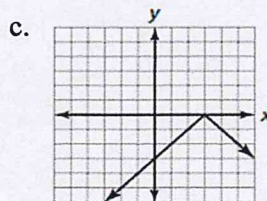
5. Determine whether each graph is discrete or continuous.



*discrete  
= dots only*

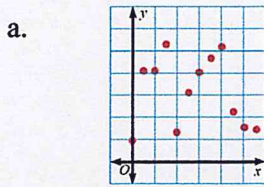


*continuous  
= connected dots*

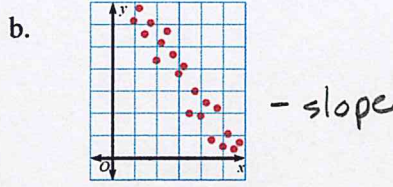


*continuous*

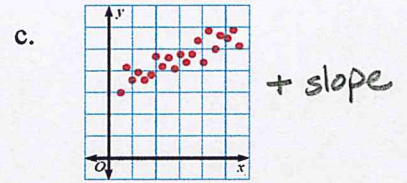
6. Determine if there is a positive, negative, or no correlation for each graph.



no correlation = dots are scattered



negative correlation



positive correlation

7. Classify each function as increasing, decreasing, or constant.

a.  $f(x) = \frac{1}{2}x - 2$   
" + "  
increasing

b.  $f(x) = -2^x$   
" - "  
decreasing

c.  $f(x) = -3x + 6$   
" - "  
decreasing

d.  $f(x) = 5$   
" 0 "  
constant

8. The attendance for the freshmen football games at Hoover High School can be represented by the linear equation:

$$y = 73x + 1963$$

$x$  = the number of games played

$y$  = the number of people attending the games

a. Predict the attendance for game 9.

$$y = 73(9) + 1963 = 657 + 1963 = 2620$$

2620 people will attend game 9

b. At which game will the attendance be about 3000?

$$3000 = 73x + 1963 \quad \frac{1037}{73} = \frac{73x}{73} \quad x = 14.21 \approx 14$$

The attendance will be about 3000 by game 14.

9. An elevator in a high-rise building moves upward at a constant rate. The table shows the height of the elevator above the ground floor after various times.

a. What are the **dependent** and **independent quantities** in this problem situation? Explain your reasoning.

DQ = height of the elevator IQ = time

The height of the elevator depends on how much time has passed, Choose 2 points (1, 12) and (2, 24)

b. Determine the unit rate of change for the problem situation.

$$ROC = \frac{\Delta y}{\Delta x} = \frac{24 - 12}{2 - 1} = \frac{12}{1} = 12$$

c. Complete the table.

d. Write an expression that represents the height ~~for~~ at time  $t$  seconds in the last row of the table.

e. Use function notation to determine the height of the elevator at 14 seconds.

Units

Time	Height
Seconds	Feet
0	0
1	12
2	24
3	36
4.5	54
5	60
$t$	$12t$

Expression

$$f(14) = 12(14) = 168 \text{ feet}$$

10. Suppose an elevator starts at the top floor of a high-rise building at a height of 350 feet above the ground floor and descends without stopping at a constant rate of 25 feet per second.

- a. Write a linear function that describes the height,  $h$ , of the elevator after  $t$  seconds.

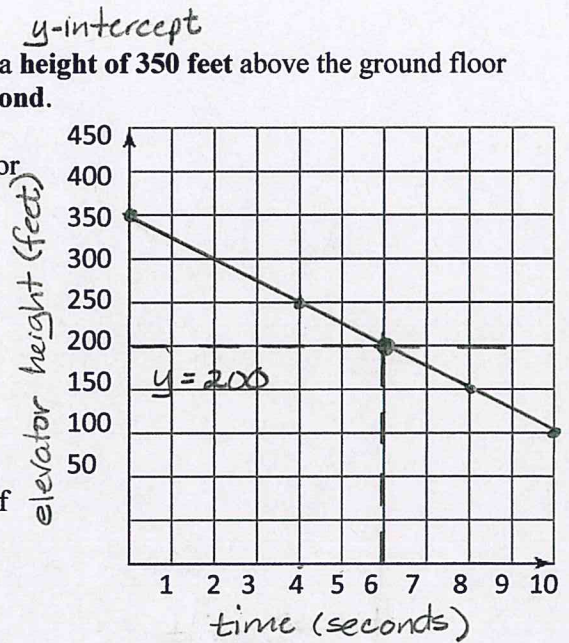
$$h(t) = -25t + 350$$

- b. Graph the function you wrote in part a. Label your axes.
- c. Use the graph to estimate when the elevator will be at a height of 200 feet.  $y = 200$  6 seconds
- d. Determine the exact time when the elevator will be at a height of 200 feet. Hint:  $h(t) = 200$ .

$$h(t) = 200 = -25t + 350$$

$$-150 = -25t$$

$$6 = t$$



11. Taylor received a \$450 gift card from his grandparents and is using it to pay for his singing lessons, which cost \$50 per month.

- a. Write a linear function that describes the dollar amount,  $d$ , on the card after  $t$  months.

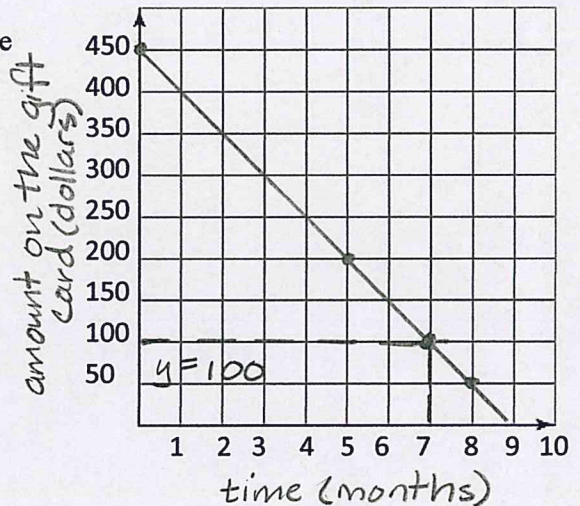
$$d(t) = -50t + 450$$

- b. Graph the function that you wrote in part a. Label your axes.
- c. Use the graph to estimate when there will be \$100 remaining on the card.  $y = 100$  7 months
- d. Determine the exact time when there will be \$100 remaining on the card. Hint:  $d(t) = 100$ .

$$d(t) = 100 = -50t + 450$$

$$-350 = -50t$$

$$7 = t$$



12. Joy has \$200 to spend at the Galleria. She decides to buy sweaters and pants with her money. Sweaters cost \$35 each and pants cost \$20 each.

- a. Write an inequality to represent this problem situation.
- $s$  = the number of sweaters  
 $p$  = the number of pants

$$35s + 20p \leq 200$$

- b. If Joy buys 3 sweaters, what is the greatest number of pants she can buy?

$$s = 3 \quad 35(3) + 20p = 200 \quad 20p = 95 \quad \text{She can buy 4 pants.}$$

$$105 + 20p = 200 \quad p = 4.75$$

- c. If Joy buys no pants, what is the greatest number of sweaters she can buy?

$$p = 0 \quad 35s + 20(0) = 200 \quad \text{She can buy 5 sweaters.}$$

$$35s = 200$$

$$s = 5.71$$

13. Josh has \$125 to spend at the electronics store and decides to buy video games and DVDs with his money. Video games cost \$40 each and DVDs cost \$15 each.

- a. Write an <sup>inequality</sup> equation to represent this problem situation.  
 $v$  = number of video games  
 $d$  = number of DVDs

$$40v + 15d \leq 125$$

- b. If Josh buys 2 video games, what is the greatest number of DVDs he can buy?

$$v=2 \quad 40(2) + 15d = 125 \quad d=3 \quad \text{He can buy 3 DVDs.}$$

$$80 + 15d = 125$$

$$15d = 45$$

- c. If Josh buys no DVDs, what is the maximum number of video games he can buy?

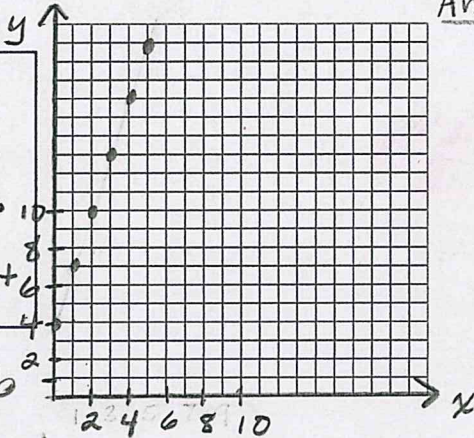
$$d=0 \quad 40v + 15(0) = 125 \quad v=3.125 \quad \text{He can buy 3 video games.}$$

$$40v = 125$$

14. Write an equation and sketch the graph for each set of given characteristics.

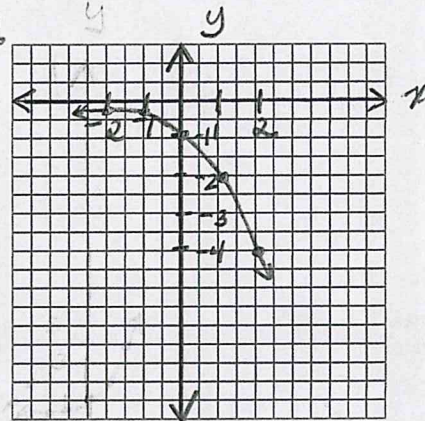
Answers will vary!

- a.
  - is a function
  - is linear ✓
  - is discrete ✓
  - is increasing ✓  
" + " slope



$y = mx + b$   
 $y = 3x + 4$

- b.
  - is a function
  - is exponential
  - is continuous
  - is decreasing  
" - " downhill



$y = a \cdot b^x$   
 $y = -2^x$

x	y = -2 <sup>x</sup>
-2	-2 <sup>-2</sup> = -1/4 or -0.25
-1	-2 <sup>-1</sup> = -1/2 or -0.5
0	-2 <sup>0</sup> = -1
1	-2 <sup>1</sup> = -2
2	-2 <sup>2</sup> = -4

15. Match the function with its appropriate function name.

Absolute value function: d

Constant function: b

Exponential function: c

Linear function: a

$y = mx + b$

a.  $f(x) = \frac{3}{4}x - 7$

b.  $f(x) = -6$

c.  $f(x) = -4^x$

d.  $f(x) = |x - 9|$

16. Evaluate the function  $f(x) = 31.572x - 17.741$  for each of these values.

a.  $f(6.2)$

$$f(6.2) = 31.572(6.2) - 17.741$$

$$= 195.7464 - 17.741$$

$$= 178.0054$$

b.  $f(-27.5)$

$$f(-27.5) = 31.572(-27.5) - 17.741$$

$$= -868.23 - 17.741$$

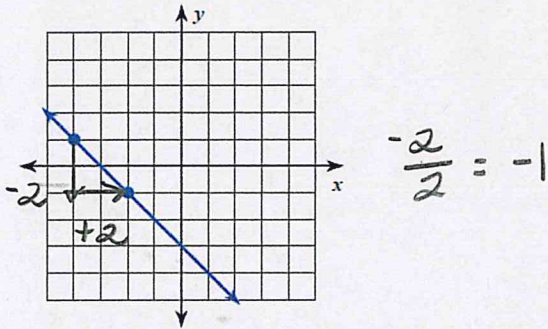
$$= -885.971$$

17. Solve each of the equations.

a.  $5(x+4) - 8 = x + 32$   
 $5x + 20 - 8 = x + 32$   
 $5x + 12 = x + 32$   
 $4x = 20$   
 $x = 5$

b.  $-3(x-6) - 5 = 175$   
 $-3x + 18 - 5 = 175$   
 $-3x + 13 = 175$   
 $-3x = 162$   $x = -54$

18. Find the slope using the graph.  $m = \frac{\text{rise}}{\text{run}}$



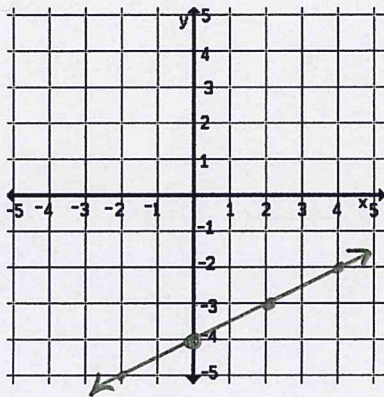
19. Find the slope using two points.  $m = \frac{y_2 - y_1}{x_2 - x_1}$

$(-2, 6)$  and  $(6, 8)$   
 $x_1, y_1$   $x_2, y_2$

$$\frac{8-6}{6-(-2)} = \frac{2}{6+2} = \frac{2}{8} = \frac{1}{4}$$

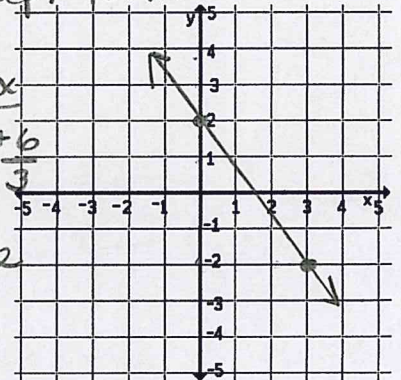
Graph each equation.

20.  $y = \frac{1}{2}x - 4$   
 slope =  $\frac{\text{rise}}{\text{run}}$   
 starting point



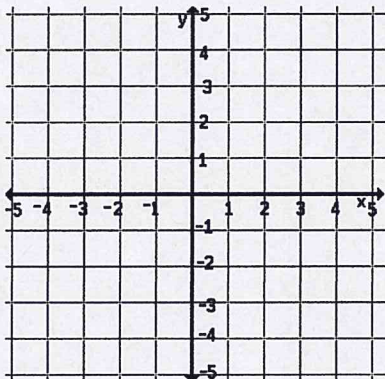
Rewrite in slope-intercept form

21.  $4x + 3y = 6$   
 $\frac{-4x}{3} = \frac{-4x}{3} + \frac{6}{3}$   
 $y = -\frac{4}{3}x + 2$



22.  $x = 4$

Slope = \_\_\_\_\_



23.  $y = -3$

Slope = \_\_\_\_\_

