

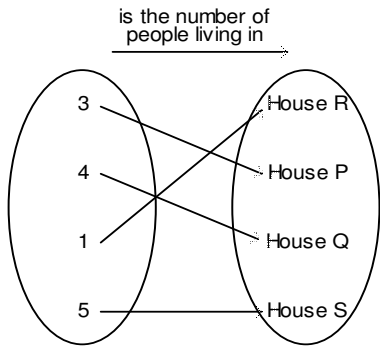
Graphing Relations and Linear Functions v1

<p><i>The slope of a line:</i></p> $m = \frac{\text{rise}}{\text{run}} \quad m = \frac{y_2 - y_1}{x_2 - x_1}$	<p><i>The equation of a line:</i></p> <p>Slope – Intercept: $y = mx + b$</p> <p>Point – Slope: $y - y_1 = m(x - x_1)$</p> <p>General: $Ax + By + C = 0$</p>
---	--

Multiple Choice

Identify the choice that best completes the statement or answers the question.

___ 1. Consider the relation represented by this arrow diagram. Represent the relation as a set of ordered pairs.



(3, house P)

x independent y dependent

- a. {(House P, 1), (House Q, 3), (House R, 4), (House S, 5)}
- b. {(3, House P), (4, House Q), (1, House R), (5, House S)}
- c. {(1, House P), (3, House Q), (4, House R), (5, House S)}
- d. {(House P, 3), (House Q, 4), (House R, 1), (House S, 5)}

___ 2. For the line $y - 14 = 3(x + 2)$, determine which slope is parallel.

- a. 7
- b. 2
- c. 14
- d. 3

point slope

___ 3. Determine the slope of the line that passes through G(3, -3) and H(-5, 9).

- a. $\frac{3}{2}$
- b. $-\frac{2}{3}$
- c. $\frac{2}{3}$
- d. $-\frac{3}{2}$

$m = \frac{9 - (-3)}{-5 - 3} = \frac{12}{-8} = -\frac{3}{2}$

___ 4. Write an equation for the graph of a linear function that has slope $-\frac{1}{3}$ and y-intercept -3.

- a. $y = -3x - \frac{1}{3}$
- b. $y = -\frac{1}{3}x - 3$
- c. $y = \frac{1}{3}x + 3$
- d. $y = 3x - \frac{1}{3}$

*$y = mx + b$
 $y = -\frac{1}{3}x + -3$
 $y = -\frac{1}{3}x - 3$*

b

5. Which equations represent perpendicular lines?

a. $y = 6x - 7, y = 6x + 7$

c. $y = 11x - 7, y = 11x + \frac{1}{7}$

b. $y = -7x + 11, y = \frac{1}{7}x + 6$

d. $y = \frac{1}{6}x + 6, y = 6x + 6$

• opp
• reciprocal
(flip)

b

6. Describe the graph of the linear function with this equation: $y + 3 = \frac{1}{3}(x - 2)$

a. The graph is a line through $(-2, 3)$ with slope $\frac{1}{3}$.

b. The graph is a line through $(2, -3)$ with slope $\frac{1}{3}$.

c. The graph is a line through $(2, -3)$ with slope $-\frac{1}{3}$.

d. The graph is a line through $(-2, 3)$ with slope $-\frac{1}{3}$.

$y - y_1 = m(x - x_1)$

$m = \frac{1}{3}$

$x_1 = 2, y_1 = -3$ (why?)

d

7. Determine the x-intercept and the y-intercept for the graph of this equation: $2x - 3y + 36 = 0$

a. x-intercept: 18; y-intercept: 12

c. x-intercept: 18; y-intercept: -12

b. x-intercept: -18; y-intercept: -12

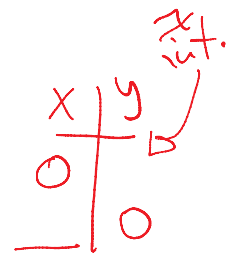
d. x-intercept: -18; y-intercept: 12

~~$2x - 3y + 36 = 0$~~

$-3y = -36 \quad y = 12$

$2x + 36 = 0$

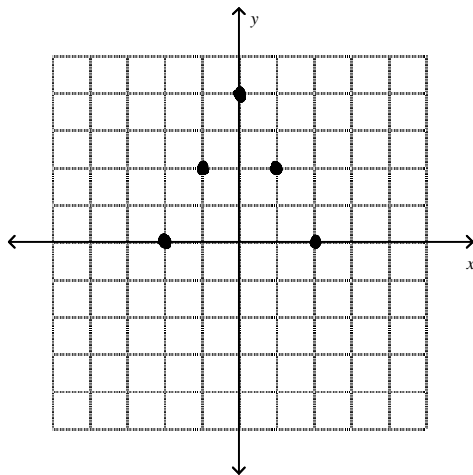
$2x = -36 \quad x = -18$ y intercept



Short Answer

8. Determine the Domain, Range, if a function, & discrete or continuous of the following:

a)



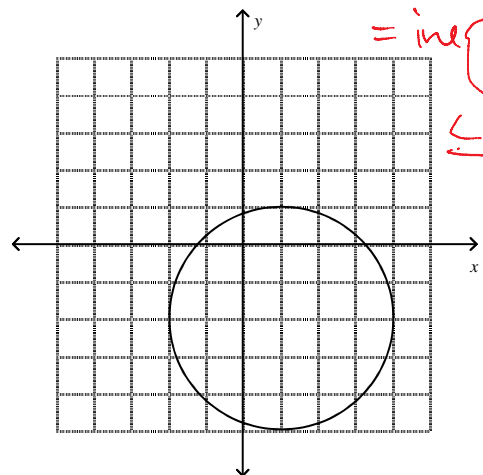
Domain: $x = \{-2, -1, 0, 1, 2\}$

Range: $y = \{0, 2, 4\}$

Function: Yes or No

Discrete or Continuous

b)



Domain: $-2 \leq x \leq 4$ or $[-2, 4]$

Range: $-5 \leq y \leq 1$ or $[-5, 1]$

Function: Yes or No

Discrete or Continuous

continuous
= inequality
 \leq, \geq

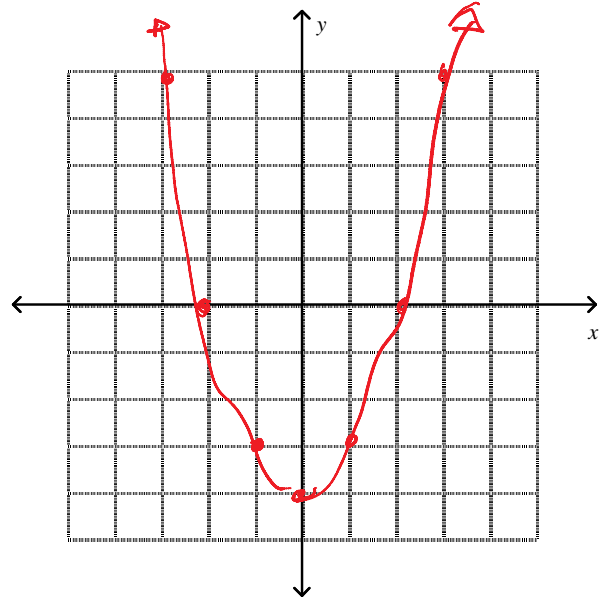
vertical line test

discrete = points

no vert. pts.

9. Consider the relation: $y = x^2 - 4$. *continuous*
 a) Complete the table of values.
 b) Plot the ordered pairs on the grid and connect the points with a smooth curve.

(x)	(y)	Ordered Pair
-3	5	
-2	0	
-1	-3	
0	-4	
1	-3	
2	0	
3	5	



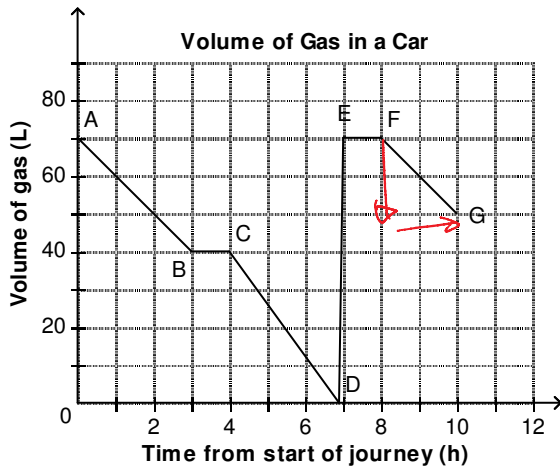
c. Is the graph Linear or Non-Linear?

NON

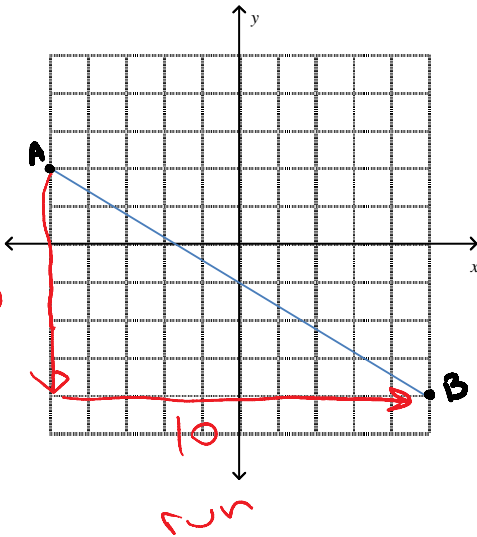
10. This graph shows the volume of gas in a car as a function of time. Describe what is happening for

- a) line segment EF in the graph: $m = 0$, stopped, not using gas 1 hr
 b) line segment DE in the graph: fill up tank
 c) find the rate of change (slope) of line segment FG (include units): $-20L/2hr$

$= -10L/hr$



11. Refer to the graph below to answer the following:



i) State the co-ordinates of a points A & B:

A(-5, 2) B(5, -4)

ii) Determine the slope line segment AB (lowest terms)

$$-\frac{6}{10} = -\frac{3}{5}$$

ii) Write an equation to describe the graph in Point-Slope form.

$$y - y_1 = m(x - x_1) \quad / \quad y - 2 = -\frac{3}{5}(x + 5)$$

iv) Change the equation into general form.

$$5y - 10 = -3(x + 5)$$

$$5y - 10 = -3x - 15$$

$$+3x \quad +15 \quad +3x \quad +15$$

$$3x + 5y + 5 = 0$$

Problems

12. Determine the equation of the line that has a slope of 3 and passes through point (0, -4). Write in slope-intercept form.

$$y = mx + b$$

$$y = 3x - 4$$

$$y - (-4) = 3(x - 0) \quad \text{point}$$

$$y + 4 = 3x$$

$$-4 = 3(0) + b$$

13. Determine the Point-Slope form of the line that passes through A(-1, -5) and B(-3, 1)

$$y + 5 = -3(x + 1)$$

$$y + 5 = -3(x + 1)$$

$$m = \frac{-5 - 1}{-1 - (-3)} = \frac{-6}{2} = -3$$

14. Determine the General form of the line that passes through A(3, -5) and is perpendicular to $y = \frac{2}{3}x + 4$

$$2 \cdot y + 10 = -\frac{3}{2}(x - 3)$$

$$2y + 10 = -3(x - 3)$$

$$2y + 10 = -3x + 9$$

$$+3x \quad -9 \quad +3x \quad -9$$

$$3x + 2y + 1 = 0$$

$$(y + 5) = -\frac{3}{2}(x - 3) \quad 2y + 10 = -3(x - 3)$$