

## 2.2 Notes: Slope from Multiple Representations

**Learning Target:** I can find the slope of a function from a table, graph, or ordered pairs.

### Slope from a Graph:

1. Describe the slope of the line.

*Decreasing*

2. What does the slope of the line represent (in this context)?

*How fast the water is draining*

3. What is the slope?

$$\frac{\text{rise}}{\text{run}} \rightarrow \frac{\downarrow -}{\leftarrow +} = \frac{-1}{1} = -1$$

4. Suppose the water was draining at a faster rate how would this affect the steepness of the line?

*It would become steeper*

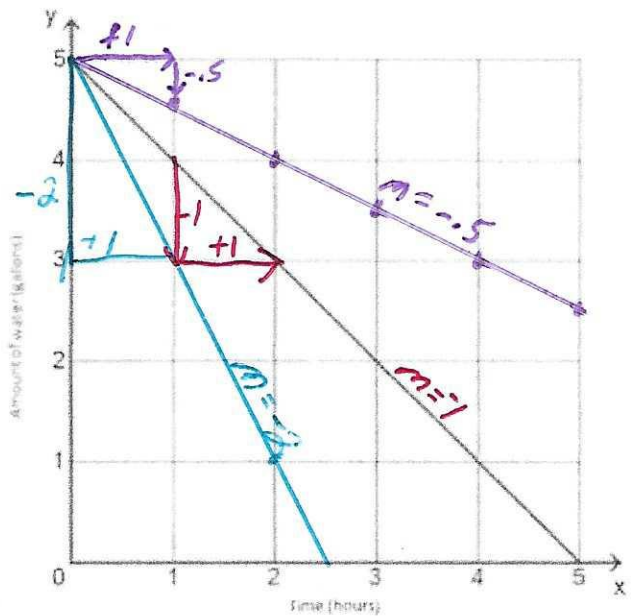
5. If the water was draining at a rate of 0.5 gal/hr, describe what would happen to the line?

*Line becomes less steep, flatter*

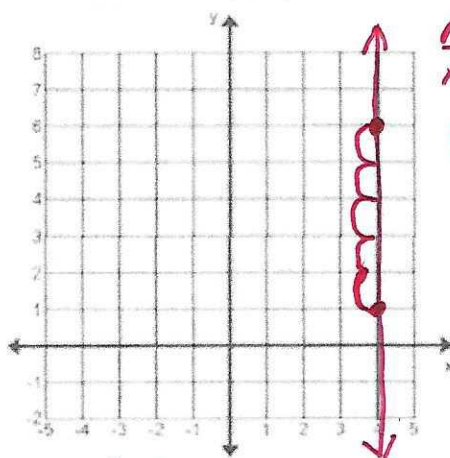
6. What do the x-intercept and y-intercept represent?

X - intercept:  $(5, 0) \rightarrow$  It takes 5 hours to drain all of the water

Y - intercept:  $(0, 5) \rightarrow$  It begins with 5 gallons of water



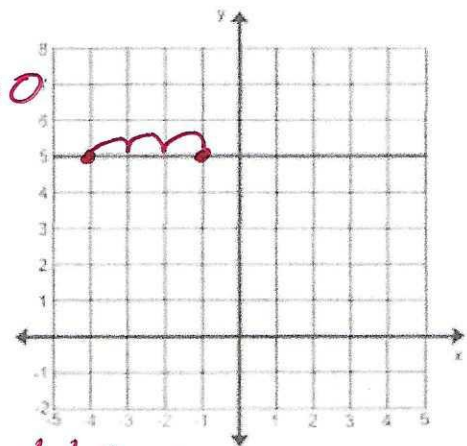
*Vertical*



$$\frac{\text{rise}}{\text{run}} = \frac{5}{0} = \text{Undefined}$$

*Vertical lines  $\rightarrow m = \text{undefined}$*

*Horizontal*



$$\frac{\text{rise}}{\text{run}} = \frac{0}{3} = 0$$

*Horizontal lines  $\rightarrow m = 0$*

## 2.2 Notes: Slope from Multiple Representations

Slope from a TABLE:  $\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$

1. Given the table to the right...

What is the constant rate?  $\frac{2}{1} = 2$   
(slope)

x	1	2	3	4	5
y	2	4	6	8	10

Linear Function (Y/N)? Yes

Linear Function → ① It has a constant rate  
② No x's repeat

Domain: {1, 2, 3, 4, 5}      Range: {2, 4, 6, 8, 10}

2. Given the table to the right...

What is the constant rate? N/A  $\frac{-4}{3} \frac{-7}{3}$

Linear Function (Y/N)? NO  
\* No constant rate

X	Y
3	3
6	-1
9	-8
12	-16

Domain: {3, 6, 9, 12}      Range: {3, -1, -8, -16}

Formula

Slope from Ordered Pairs:  $\frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$

(x<sub>1</sub>, y<sub>1</sub>) (x<sub>2</sub>, y<sub>2</sub>)  
1<sup>st</sup> point    2<sup>nd</sup> point

3. (2,4) (5,3) (8,2) (11,1)

$$\frac{3-4}{5-2} = \frac{-1}{3} \checkmark$$

What is the constant rate?  $-\frac{1}{3}$

Linear Function? Yes

Domain: {2, 5, 8, 11}

Range: {4, 3, 2, 1}

$$\frac{3-2}{5-8} = \frac{1}{-3} \checkmark \quad \frac{1-2}{11-8} = \frac{-1}{3} \checkmark$$

3. (2,2) (4,-1) (6,-4) (8,-7)

$$\frac{-1-2}{4-2} = \frac{-3}{2} \quad \frac{-4-(-1)}{6-4} = \frac{-3}{2} \quad \frac{-7-(-4)}{8-6} = \frac{-3}{2}$$

What is the constant rate?  $-\frac{3}{2}$

Linear Function? Yes

Domain: {2, 4, 6, 8}

Range: {2, -1, -4, -7}

$$\frac{\Delta y}{\Delta x} = \frac{-3}{2}$$

x	y
2	2
4	-1
6	-4
8	-7

## 2.2 Notes: Slope from Multiple Representations

# Constant Rate of Change and Initial Value

**Example 1:** Randy enters a jalapeno eating contest. Randy eats them at a rate of 7 per minute. When the contest begins, Randy's plate has 60 jalapenos on it.

- a. What is the constant rate of change? -7 jal/min
- b. What is the initial value (at time=0)? 60 jalapenos (0,60)
- c. How long will it take to eat all 60 jalapenos? 9 mins

T	#
0	60
1	53
2	46
3	39
4	32
5	25

6	18
7	11
8	4
9	-3

**Example 2:** Megan is going to the Warrior volleyball game. She buys a ticket for \$2.50 and decides to buy several cheeseburgers that cost \$7.50 each.

Which of the following statements about the (rate) slope is true?

- a. The slope represents the cost per food item.
- b. The slope represents Megan's total cost.
- c. The slope represents how many items of food Megan can buy.
- d. The slope represents the cost of the ticket.

Ticket  
\$ 2.50 (initial)

Hamburger  
\$ 7.50 (slope)

**Example:**  $y = -\frac{5}{3}x + 4$

Which of the following statements about the slope is true?

- a. As the value decreases by 5, the y value increases by 5.
- b. As the x value increases by 3, the y value decreases by 5.
- c. As the x value increases by 5, the y value decreases by 3.
- d. As the x value decreases by 3, the y value decreases by 5.

$$m = \frac{-5}{3} = \frac{\Delta y}{\Delta x}$$