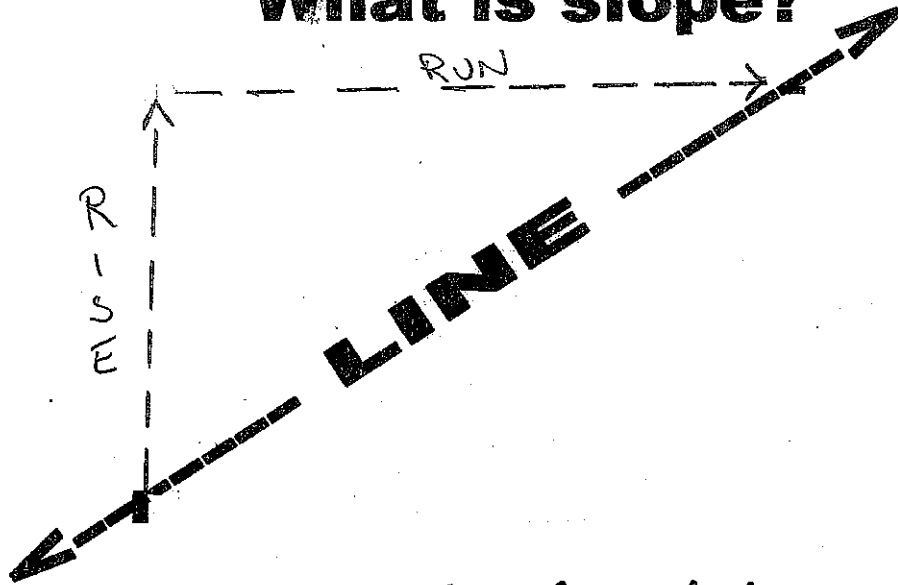


Key

What is slope?



$$\text{slope} = \frac{\text{rise(up / down)}}{\text{run(right)}}$$

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

*Remember: $\frac{0}{\text{any \#}} = 0$

$\frac{\text{any \#}}{0} = \text{undefined}$

Finding Slope From a Graph

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Name _____

Date _____

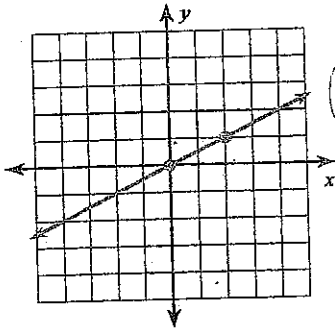
Period _____

Find the slope of each line.

$$\begin{matrix} x_1, y_1 & x_2, y_2 \\ (0, 0) & (2, 1) \end{matrix}$$

$$\begin{matrix} x_1, y_1 & x_2, y_2 \\ (-4, 1) & (-2, -1) \end{matrix}$$

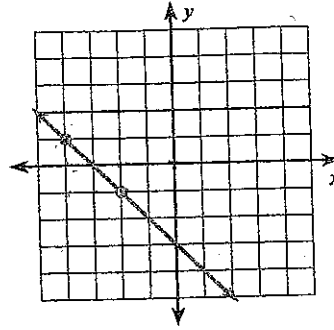
1)



$$\frac{1}{2}$$

$$\frac{1 - 0}{2 - 0} = \frac{1}{2}$$

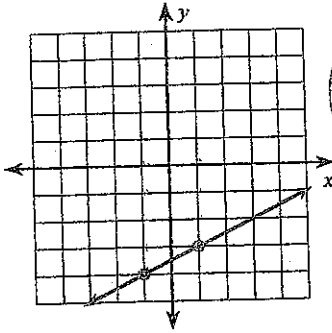
2)



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

Down 1
Over 1

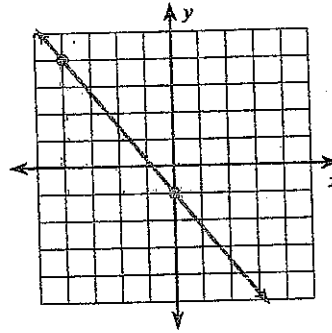
3)



$$\frac{1}{2}$$

$$\begin{matrix} (-1, -4) & (1, 3) \\ -3 - (-4) & 1 - (-1) \end{matrix} = \frac{1}{2}$$

4)

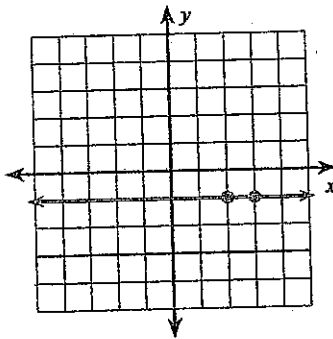


$$\frac{5}{4}$$

$$\begin{matrix} x_1, y_1 & x_2, y_2 \\ (-4, 4) & (0, -1) \end{matrix}$$

$$\frac{-1 - 4}{0 - (-4)} = \frac{-5}{4}$$

5)

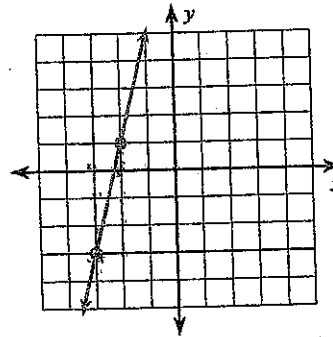


$$(2, 0) \quad (3, 0)$$

$$\frac{0 - 0}{3 - 2} = \frac{0}{1}$$

0 = slope

6)

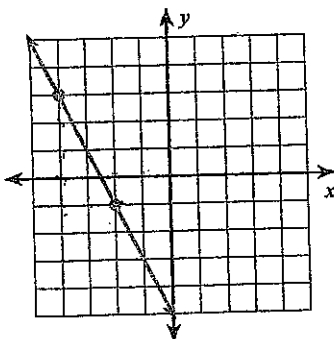


$$\frac{-4}{1} = -4$$

$$\begin{matrix} (-2, 1) & (-3, 3) \\ -3 - 1 & -3 - (-2) \end{matrix}$$

$$\frac{-4}{1} = -4$$

7)

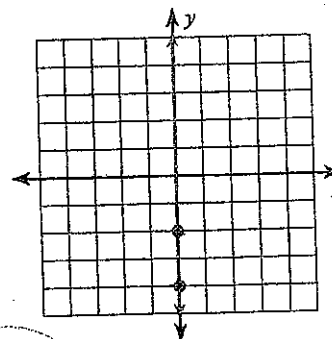


$$\frac{-4}{2} = -2$$

$$\begin{matrix} (-4, 3) & (-2, 1) \\ -1 - 3 & -2 - (-4) \end{matrix}$$

$$\frac{-4}{2} = -2$$

8)

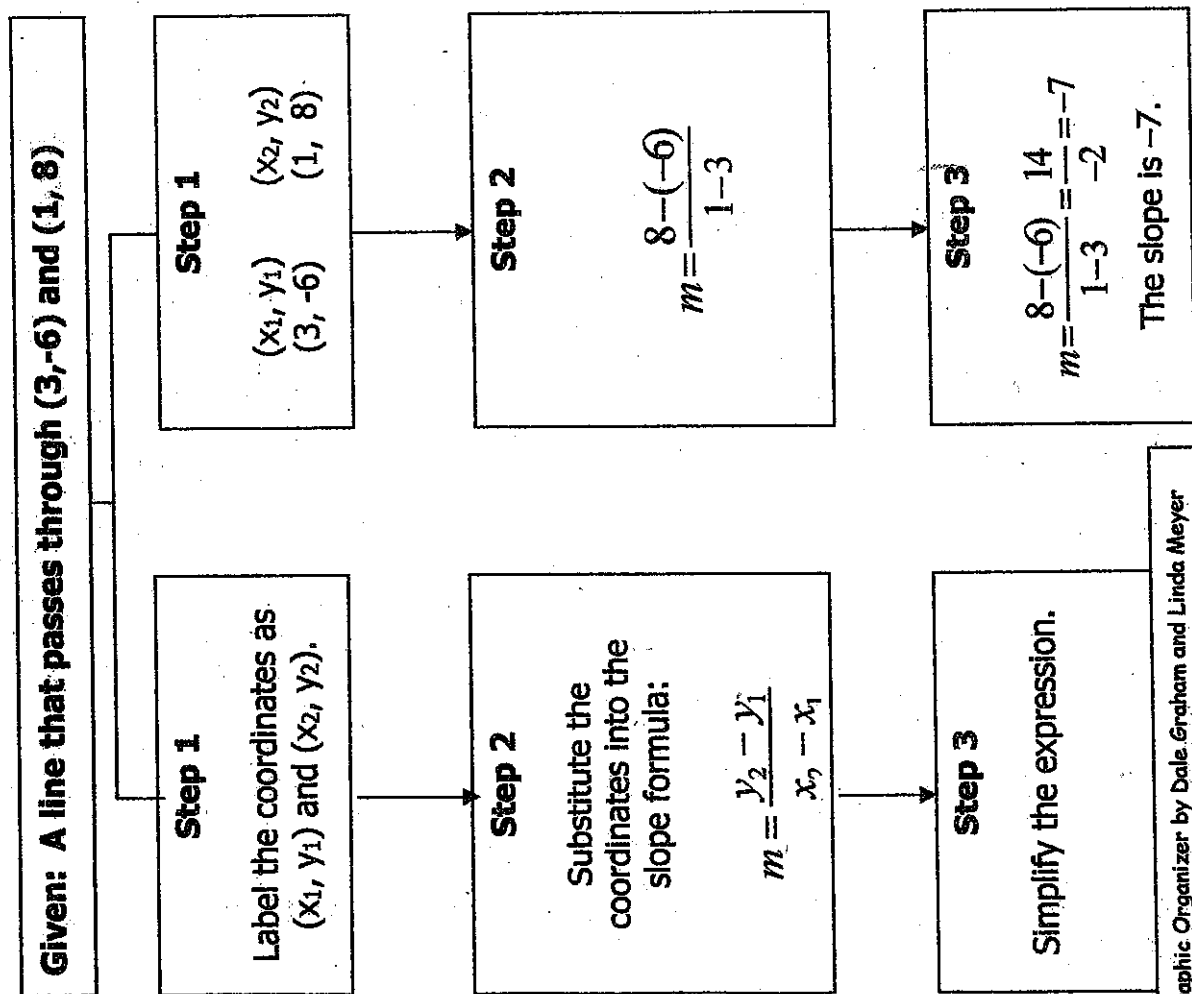
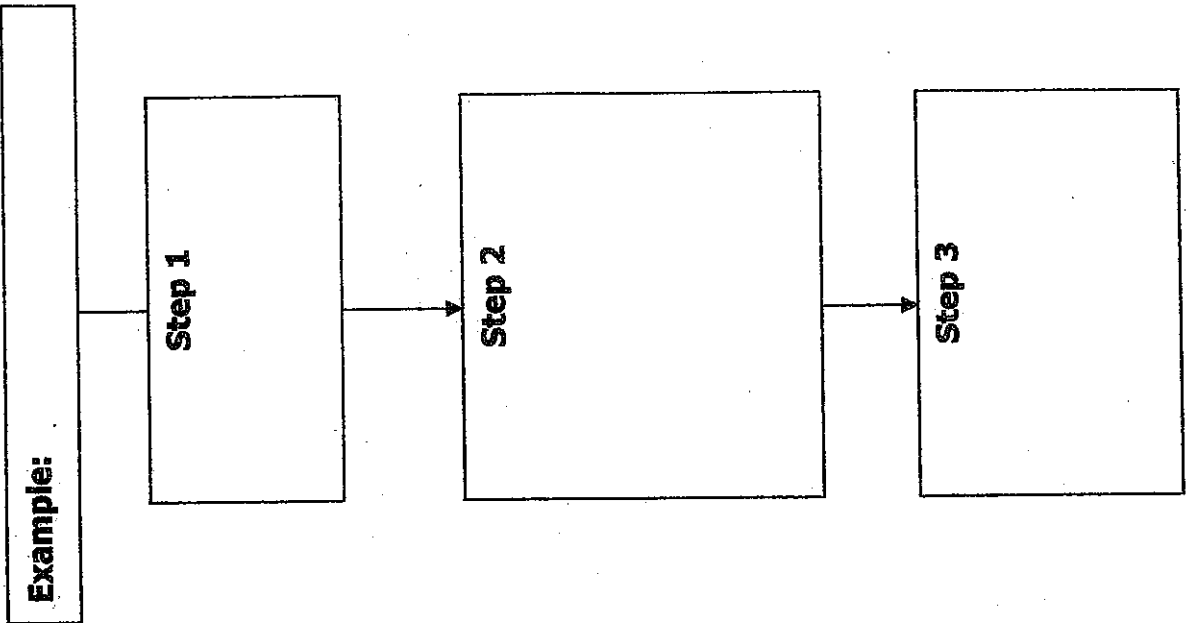


$$(0, -2) \quad (0, -4)$$

$$\frac{-4 - (-2)}{0} = \frac{2}{0}$$

Undefined

How do you find the slope of a line given two points on the line?



Graphic Organizer by Dale Graham and Linda Meyer
Thomas County Central High School, Thomasville GA

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Finding Slope From Two Points

Find the slope of the line through each pair of points.

1) $(19, -16), (-7, -15)$

$$\frac{-15 - (-16)}{-7 - 19} = \frac{1}{-26}$$

2) $(1, -19), (-2, -7)$

$$\frac{-7 - (-19)}{-2 - 1} = \frac{-8}{-3}$$

3) $(-4, 7), (-6, -4)$

$$\frac{-4 - 7}{-6 - (-4)} = \frac{-11}{-2} = \frac{11}{2}$$

4) $(20, 8), (9, 16)$

$$\frac{16 - 8}{9 - 20} = \frac{8}{-12} = -\frac{2}{3}$$

Reduce
fraction
Keep NEG

5) $(17, -13), (17, 8)$

$$\frac{8 - (-13)}{17 - 17} = \frac{21}{0}$$

Undefined
Zero under numerator

6) $(19, 3), (20, 3)$

$$\frac{3 - 3}{20 - 19} = \frac{0}{1} = 0$$

zero on top
zero is the slope

7) $(3, 0), (-11, -15)$

$$\frac{-15 - 0}{-11 - 3} = \frac{-15}{-14} = \frac{15}{14}$$

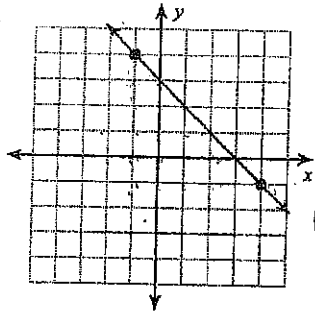
8) $(19, -2), (-11, 10)$

$$\frac{10 - (-2)}{-11 - 19} = \frac{12}{-30} = -\frac{2}{5}$$

Linear Functions Homework

Find the slope of each line.

1)

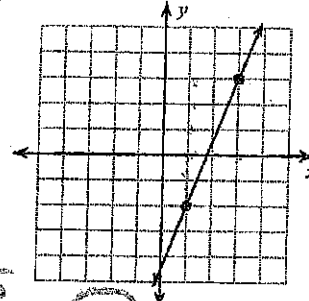


$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 4}{4 - (-1)} = \frac{-5}{5} = -1$$

or

$$\frac{-1 - 4}{4 - (-1)} = \frac{-5}{5} = -1$$

2)



$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 3}{3 - (-2)} = \frac{-5}{5} = -1$$

Find the slope of the line through each pair of points.

x_1, y_1, x_2, y_2

3) (18, -4), (13, 3)

$$\frac{3 - (-4)}{13 - 18} = \frac{7}{-5} = -\frac{7}{5}$$

4) (9, -17), (18, -2)

$$\frac{-2 - (-17)}{18 - 9} = \frac{15}{9} = \frac{5}{3}$$

5) (10, 8), (19, -16)

$$\frac{-16 - 8}{19 - 10} = \frac{-24}{9} = -\frac{8}{3}$$

6) (11, -20), (3, -2)

$$\frac{-2 - (-20)}{3 - 11} = \frac{18}{-8} = -\frac{9}{4}$$

Find the slope of each line.

7) $y = -\frac{7}{5}x + 4$

$-\frac{7}{5}$

8) $y = -1$

Slope is zero
can be written as
 $y = 0x - 1$

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

9) Slope = 4, y-intercept = -3

$$y = 4x - 3$$

10) Slope = 10, y-intercept = 5

$$y = 10x + 5$$

Write the slope-intercept form of the equation of each line. (HINT: Rearrange and solve for y)

11) $5x - 2y = -10$

$$\begin{aligned} -5x & \quad -5x \\ -2y & = -5x - 10 \\ \frac{-2y}{-2} & = \frac{-5x}{-2} - \frac{10}{-2} \\ y & = \frac{5}{2}x + 5 \end{aligned}$$

12) $2x - y = -7$

$$\begin{aligned} -2x & \quad -2x \\ -y & = -2x - 7 \\ \frac{-y}{-1} & = \frac{-2x}{-1} - \frac{7}{-1} \\ y & = 2x + 7 \end{aligned}$$

Change in "y"
Change in "x"

x	y
1	-3
2	2
3	7
5	17

Use a table to determine the slope of a line.

Step 1: Identify the change in each consecutive pair of y-values in the table. In this case, the changes are 5, 5 and 10.

Step 2: Identify the change in each consecutive pair of x-values in the table. In this case, the changes are 1, 1, and 2.

Step 3: Write ratios showing the corresponding $\frac{\text{vertical change}}{\text{horizontal change}}$ in simplest form. In this case, the ratios $\frac{5}{1}$, $\frac{5}{1}$, and $\frac{10}{2}$ each simplify to $\frac{5}{1}$.

The slope of the line is $\frac{5}{1}$.



Finding Slope from Tables

Name _____
Date _____ Period _____

Determine the slope of the line represented by the table of values. Describe the graphs of the line as increasing, decreasing, horizontal, or vertical.

$$\frac{y}{x}$$

1.

x	y
-2	3
-1	5
0	7
1	9
2	11

$$m = \frac{2}{1} \text{ or } 2$$

Graph Description
increasing

2.

x	y
-3	5
-2	2
-1	-1
0	-4
1	-7

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

Graph Description
decreasing

3.

x	y
1	-17
2	-13
3	-9
4	-5
5	-1

$$m = \frac{4}{1} = 4$$

Graph Description
increasing

4.

x	y
-6	-4
-5	-9
-4	-14
-3	-19
-2	-24

$$m = \frac{-5}{1} = -5$$

Graph Description
decreasing

5.

x	y
0	3
1	5.5
2	8
3	10.5
4	13

$$m = \frac{2.5}{1} = 2.5$$

m =

Graph Description
increasing

6.

x	y
-2	5
-1	4.75
0	4.5
1	4.25
2	4

$$m = \frac{-0.25}{1} = -0.25$$

m =

Graph Description
decreasing

7.

x	y
-2	$\frac{2}{5}$
-1	$\frac{4}{5}$
0	$\frac{6}{5}$
1	$\frac{8}{5}$

$$m = \frac{2/5}{1} = 2/5$$

Graph Description
increasing

8.

x	y
-1	1
1	2
3	3
5	4
7	5

$$m = \frac{1}{2}$$

$$m = \frac{1}{2}$$

Graph Description

9.

x	y
-5	10
-2	5
1	0
4	-5
7	-10

$$m = \frac{-5}{3}$$

Graph Description
decreasing

10.

x	y
-5	10
-3	6
-1	2
1	-2
3	-6

$$m = \frac{-4}{2} = -2$$

Graph Description
decreasing

11.

x	y
-4	6
-2	6
0	6
2	6
4	6

$$m = \frac{0}{2} = 0$$

Graph Description
Slope is 0

12.

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

$$m = \frac{2}{0} = \text{undefined}$$

Graph Description
zero under