

Slope Worksheet and Activity

I. Model Problems

Modeling how to calculate slope (associated online demonstration [here](#))

II. Student Exploration.

Exploring slope formula using an online interactive program.

III and IV. Practice Problems

Student practice calculating slope
(answers to problems online [here](#))

V. Answer Key

Answers to Part III and IV also online at <http://www.mathwarehouse.com/slope2>

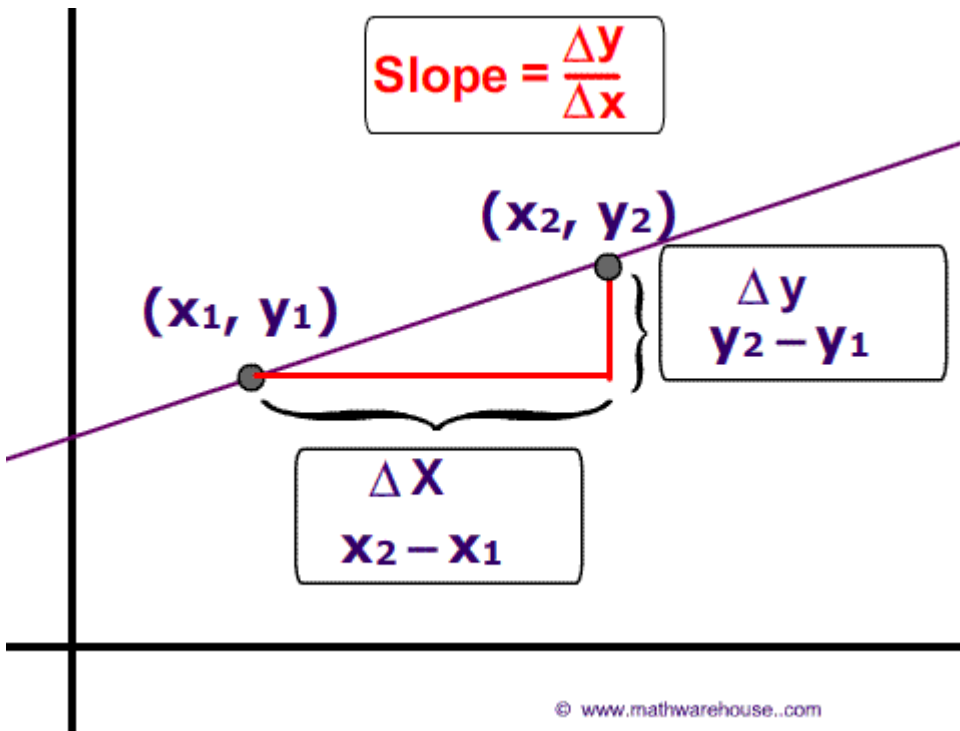
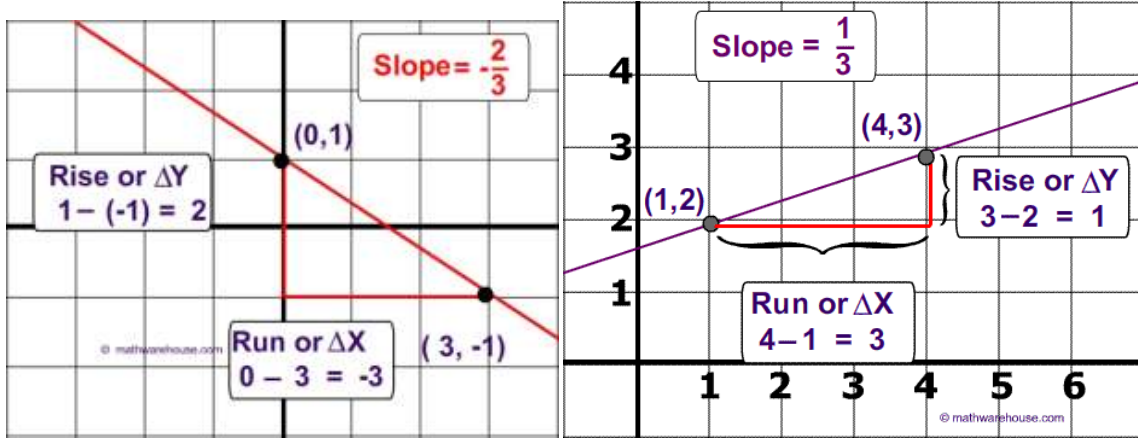
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Online Graphing Calculator(free): <http://www.meta-calculator.com/online/>

The Slope Formula

$$\text{Slope} = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{\text{Rise}}{\text{Run}} = \frac{\Delta Y}{\Delta X}$$

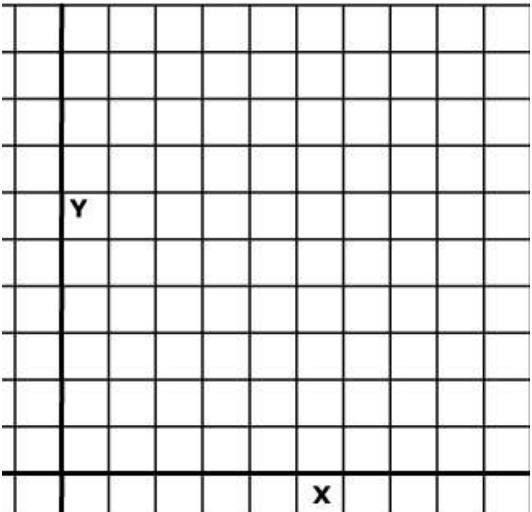
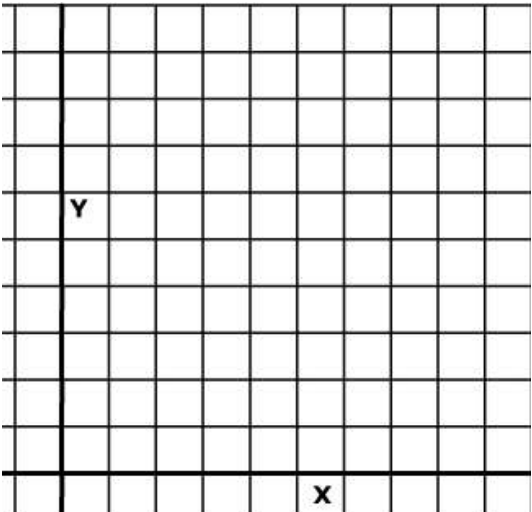


Part I . Exploratory Activity

- 1) Go to the following web page <http://www.mathwarehouse.com/slope>

Drag the two points and change the direction of the line until you can answer questions A-D.

- A) If a line has a **negative slope**, what is its general direction?
- B) If a line has a **positive slope**, what is its general direction?
- C) Describe the direction of a line with a slope of zero.
- D) Describe the direction of a line whose slope is undefined

<p>E) Sketch a line with a positive slope</p> 	<p>F) Sketch a line with a negative slope</p> 
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Part II.

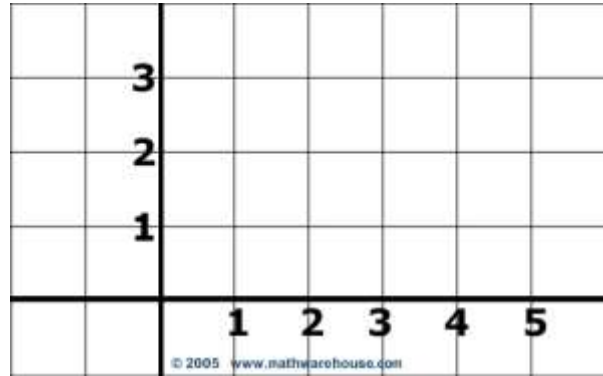
What is the slope of a line passing through (4, 3) and (3,1) ?

Find the slope of line P.

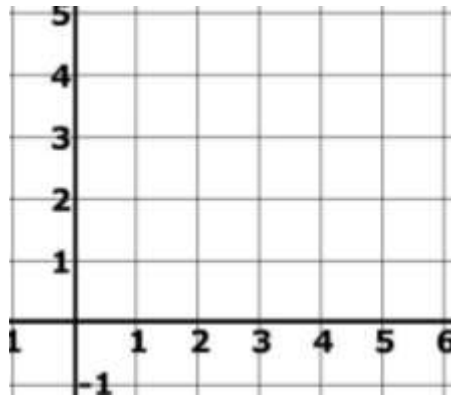
1) What is the rise (or ΔY) ?

2) What is the run (or ΔX) ?

3) What is the slope?



4) Find the slope of a line passing through the points (1,2) and (4, 3)



Directions: Use the slope formula (without graphing) to find the slope of a line passing through the points below. Answers at <http://www.mathwarehouse.com/slope5>

5) (10,3) and (7 , 9)

6) (4, -2) and (4, 3)

7) (2,10) and (8 , 7)

8) (7, 3) and (8, 5)

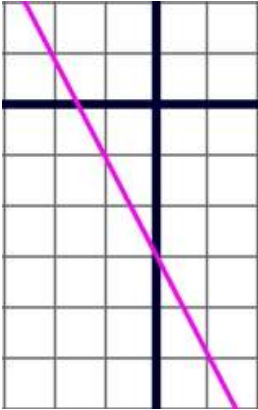
9) (12,11) and (9 , 5)

10) (6, 2) and (3, 2)

III. Finding the Slope from a Graph

What is the slope of the lines in the graphs below?

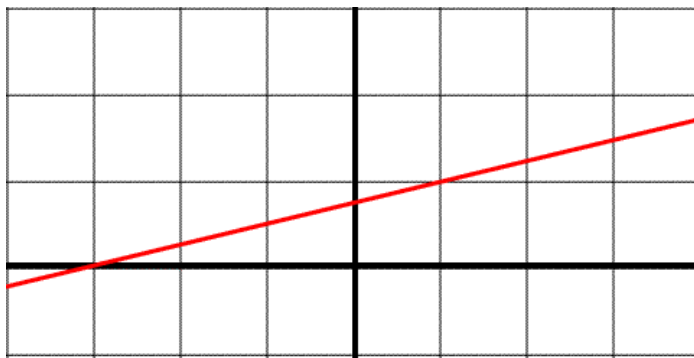
11)



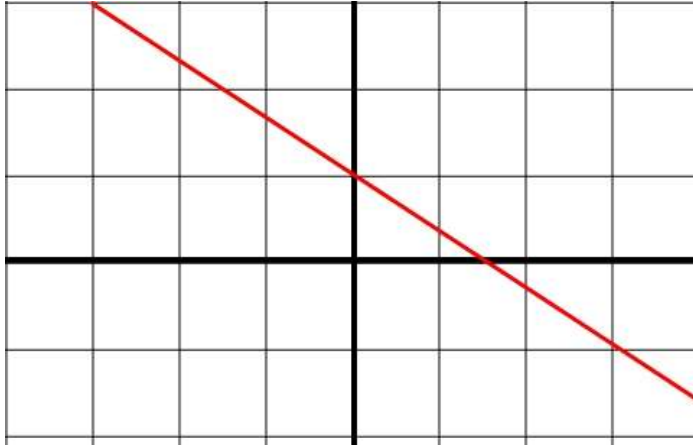
12)



13)



14)



IV. Find the Missing Coordinate

15) The slope of a line is $\frac{3}{2}$ and the line contains the points (5,9) and (3,a). What is the value of a?

16) The slope of a line is -2 and the line contains the points (7 ,4) and (x, 12). What is the value of x?

17) The slope of a line is $-\frac{2}{t}$ and the line contains the points (-2 ,4) and (-6, 10). What is the value of t?

Think –Pair-Share

Maria, Jose, Michael and Jeffrey are working together. They need to find the slope of the line passing through (7, 3) and (5, 9). Each person wants to solve the problem differently.

Here's how Jose wants to solve the problem $\frac{9-3}{5-7}$

Here's, what Michael wants to do $\frac{3-9}{7-5}$

Here's what Jeffrey wants to do $\frac{3-9}{5-7}$

Here's how Maria wants to solve the problem $\frac{9-3}{7-5}$

Who is correct? Explain

Explanation

Homework

Direction: *What is the slope of a line passing through the points below*

1) $(2, 4)$ and $(4, 9)$

2) $(13, 6)$ and $(3, 1)$

3) $(12, 2)$ and $(12, 16)$

4) $(3, 2)$ and $(12, 2)$

Online Homework

Visit both of the URLs below (you may want to turn off your computer's volume.) Both of these pages incorrectly calculate the slope. Explain what is wrong on each page

5) <http://www.mathwarehouse.com/slope3>

Explain the error with this page's use of slope formula

6) <http://www.mathwarehouse.com/slope4>

Explain the error with this page's use of slope formula

Answer Key

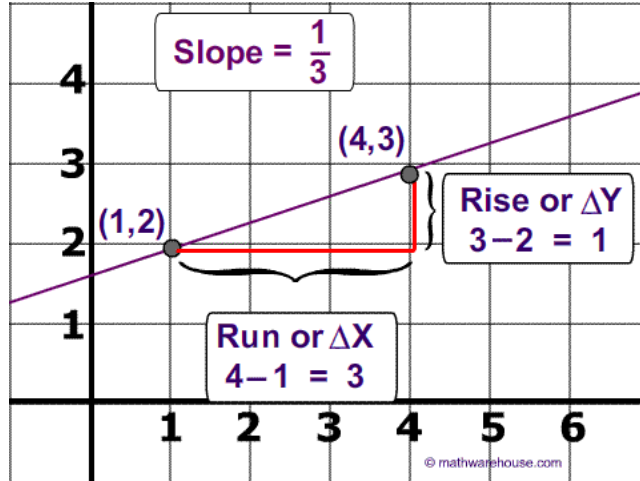
Part II.

1) $\Delta y = 1 - 3 = -2$

2) $\Delta x = 3 - 4 = 1$

3) slope = $\frac{\Delta y}{\Delta x} = \frac{-2}{-1} = 2$

4)



5) $\frac{\Delta y}{\Delta x} = \frac{9-3}{7-10} = \frac{6}{-3} = -2$ or $\frac{3-9}{10-7} = \frac{-6}{3} = -2$

6) $\frac{\Delta y}{\Delta x} = \frac{3-(-2)}{4-4} = \frac{5}{0} = \text{undefined}$ or $\frac{-2-3}{4-4} = \text{undefined}$

this is the slope of a vertical line

7) $\frac{\Delta y}{\Delta x} = \frac{7-10}{8-2} = \frac{-3}{6} = -\frac{1}{2}$ or $\frac{10-7}{2-8} = \frac{3}{-6} = -\frac{1}{2}$

8) $\frac{\Delta y}{\Delta x} = \frac{5-3}{8-7} = \frac{2}{1} = 2$ or $\frac{3-5}{7-8} = \frac{-2}{-1} = 2$

9) $\frac{\Delta y}{\Delta x} = \frac{5-11}{9-12} = \frac{-6}{-3} = 2$ or $\frac{11-5}{12-9} = \frac{6}{3} = 2$

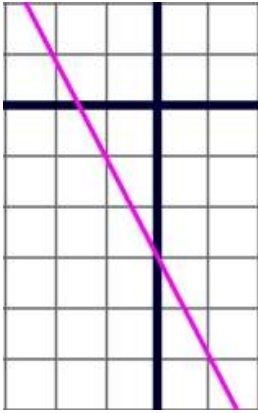
10) $\frac{\Delta y}{\Delta x} = \frac{2-2}{3-6} = \frac{0}{-3} = 0$ or $\frac{2-2}{6-3} = \frac{0}{3} = 0$

This is the slope of a horizontal line.

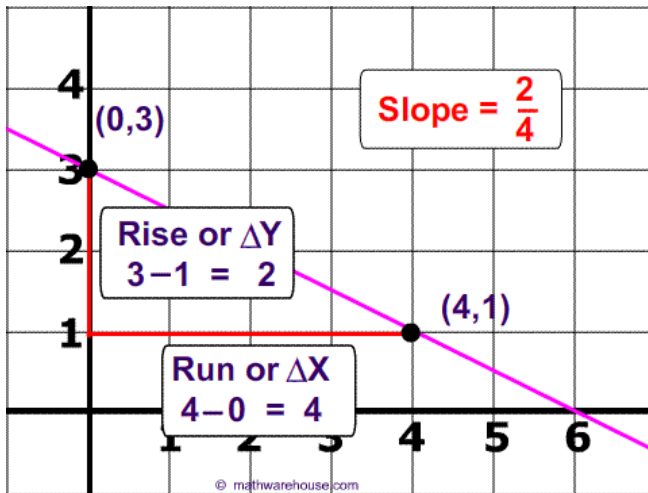
(answers continued on next page)

11) Plot any 2 points and find their slope . . For instance, you could use the points (0,-3) and (1,-5)

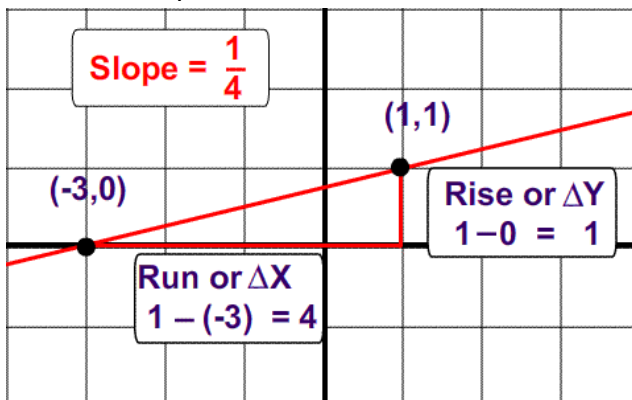
$$\frac{\Delta y}{\Delta x} = \frac{-5 - (-3)}{1 - 0} = \frac{-2}{1} = -2 \text{ or } \frac{\Delta y}{\Delta x} = \frac{-3 - (-5)}{0 - 1} = \frac{2}{-1} = -2$$



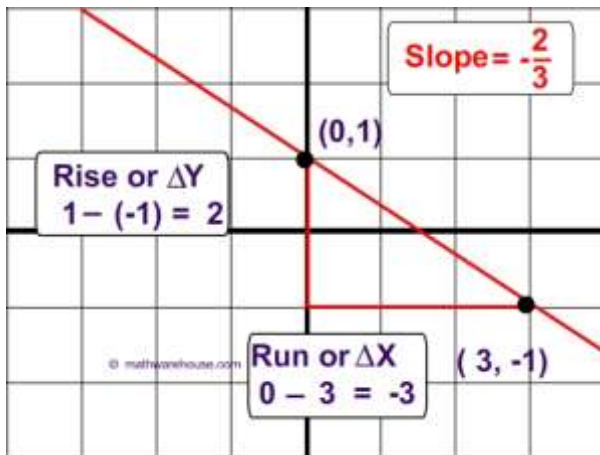
12) $slope = \frac{2}{4} = \frac{1}{2}$



13) $slope = \frac{1}{4}$



$$14) \text{ slope} = -\frac{2}{3}$$



The slope of a line is $\frac{3}{2}$ and the line contains the points (5,9) and (3,a). What is the value of a?

$$15) \frac{3}{2} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{3}{2} = \frac{a - 9}{3 - 5}$$

$$\frac{3}{2} = \frac{a - 9}{-2}$$

$$-6 = 2a - 18$$

$$12 = a$$

$$16) -2 = \frac{y_2 - y_1}{x_2 - x_1}$$

$$-2 = \frac{12 - 4}{x - 7}$$

$$-2 = \frac{8}{x - 7}$$

$$-2(x - 7) = 8$$

$$-2x + 14 = 8$$

$$-2x = -6$$

$$x = 3$$

$$17) \frac{-2}{t} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{-2}{t} = \frac{10 - 4}{-6 - (-2)}$$

$$\frac{-2}{t} = \frac{6}{-6 + 2} \rightarrow \frac{-2}{t} = \frac{6}{-4}$$

$$8 = 6t$$

$$\frac{8}{6} = t \rightarrow t = \frac{4}{3}$$

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Slope Resources

- 1) [Slope of a Line](http://www.mathwarehouse.com/algebra/linear_equation/slope-of-a-line.php) : http://www.mathwarehouse.com/algebra/linear_equation/slope-of-a-line.php
- 2) [Interactive Slope](http://www.mathwarehouse.com/algebra/linear_equation/slope-of-a-line.php): http://www.mathwarehouse.com/algebra/linear_equation/slope-of-a-line.php
- 3) [Slope Intercept Form](http://www.mathwarehouse.com/algebra/linear_equation/slope-intercept-form.php) of a line:
http://www.mathwarehouse.com/algebra/linear_equation/slope-intercept-form.php
- 4) Common Slope Errors (interactive online activities)
 - a. http://www.mathwarehouse.com/algebra/linear_equation/slope/slope_dilemma8.html
 - b. http://www.mathwarehouse.com/algebra/linear_equation/slope/2nd-slope_dilemma8.htm

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