

Warm Up

Draw an example of the following:

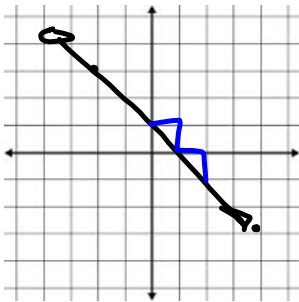
undefined

Negative slope

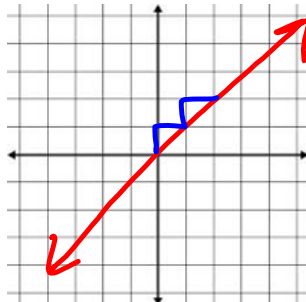
Positive slope

0 slope

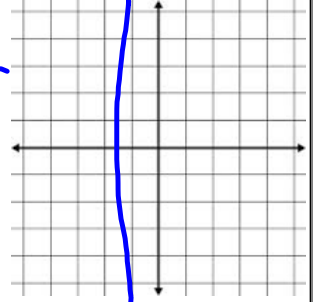
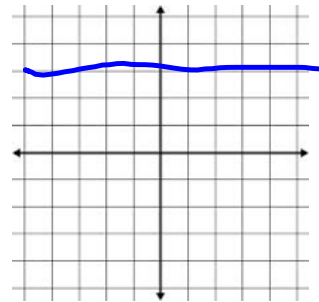
undefined
No slope



-



+



4-2 Slope Between Two Points

Objective: I can find the slope between
two points without a graph.

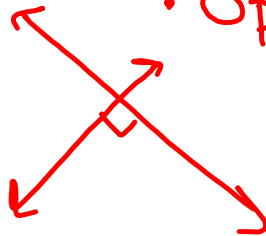
Vocabulary

$$\text{Slope Formula: } m = \frac{(x_1, y_1)(x_2, y_2) \quad y_2 - y_1}{x_2 - x_1}$$

Parallel Lines Slope: Same Slope

Perpendicular Lines Slope:

- Reciprocal (FLIP)
- Opposite Signs



Finding the slope of a table of values is not much different than finding slope on a graph.

x	y
1	2
2	4
3	6
4	8

+1
+1
+1

Change in y's: +2

Change in x's: +1

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

Slope: 2

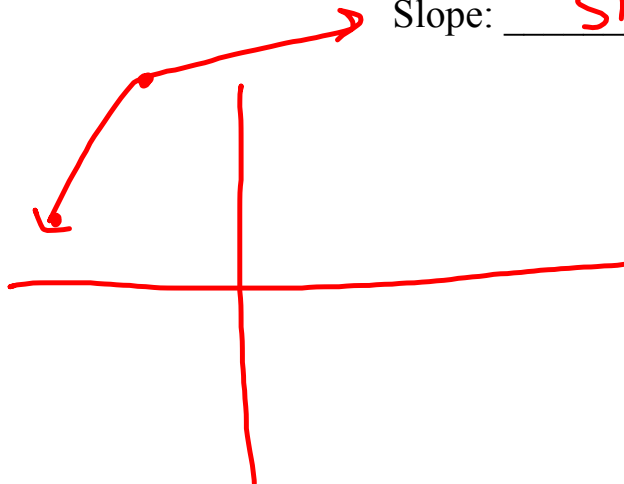
x	y
-6	3
-4	9
-2	12
0	15

Change in y's: _____

Change in x's: _____

No constant slope

Slope: _____



Find the slope of the following tables:

X	Y
-7	-4
-5	0
-3	4
-1	8

Handwritten annotations in red: $\Delta x = 2$ (between rows), $\Delta y = 4$ (between rows).

Slope: $\frac{4}{2} = 2$

X	Y
2	3
3	5
4	7
5	9
7	13

Handwritten annotations in blue: $\Delta x = 1$ (between rows), $\Delta y = 2$ (between rows). The row (4, 7) is circled in green.

Slope: $\frac{2}{1} = 2$

What is different about this table?

X	Y
3	5
4	7
6	11
7	13

Find the change in x's and change in y's from one row to the next row on the side of the table.

+1
+2
+1

+2
+4
+2

SLOPE :

2

Does the ratio stay the same? Why or why not?

Yes!

In the following tables, start with $x = 0$ and y whatever you want and then fill in the remaining values with the given slope.

Slope: $2/3$

Slope: $1/3$

Slope: $-1/2$

Slope: 0

x	y
0	3
3	5
6	7
9	9

Handwritten notes: A vertical bracket on the left side of the table spans the first three rows, with a '+3' next to it. A horizontal bracket on the right side of the table spans the first two rows, with a '+2' next to it. Similar brackets are present for the other two rows.

x	y
0	3
3	4
6	5
9	6

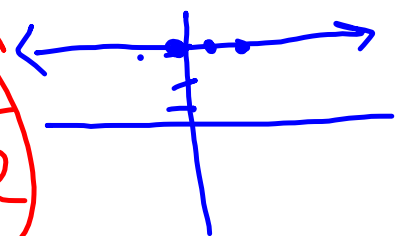
x	y
0	3
2, -2	2, 4
4, -4	1, 5
6, -6	0, 6

x	y
0	3
1	3
2	3
100	3

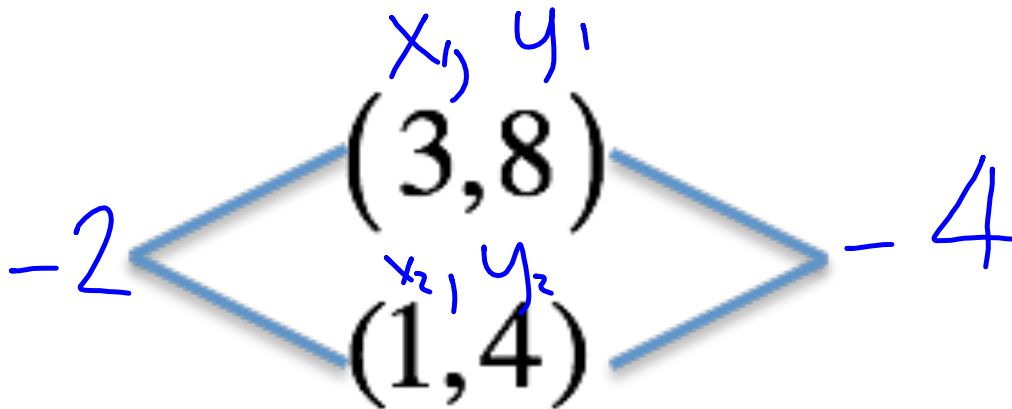
$$\frac{2}{3} = \frac{\Delta y}{\Delta x}$$

$$\frac{1}{3} = \frac{\Delta y}{\Delta x}$$

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



Example: Find the slope of the line that passes through the points (1,4) and (3, 8)



Slope: $4/2 = 2$ $\frac{-4}{-2} = \boxed{2}$

Find the slope of the line through the following ordered pairs:

1. (3,0) and (7, -2)

2. (-1, -2) and (-3, 8)

Handwritten work for problem 1:

$$\begin{array}{c} x \quad y \\ (3, 0) \\ (7, -2) \\ \hline \frac{-2}{4} = \frac{-1}{2} \end{array}$$

The calculation shows the slope is $-\frac{1}{2}$. A bracket on the right side of the points is labeled with a "-2", and a bracket on the left side is labeled with a "+4".

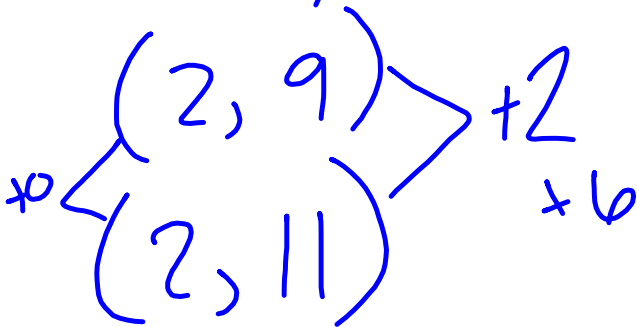
Handwritten work for problem 2:

$$\begin{array}{c} x, y \\ (-1, -2) \\ (-3, 8) \\ \hline \frac{10}{-2} = \boxed{-5} \end{array}$$

The calculation shows the slope is -5 . A bracket on the right side of the points is labeled with a "+10". Below the calculation is a number line with tick marks from -3 to 8, with the number 8 written at the far right end.

3. (2, 9) and (2, 11)

x, y

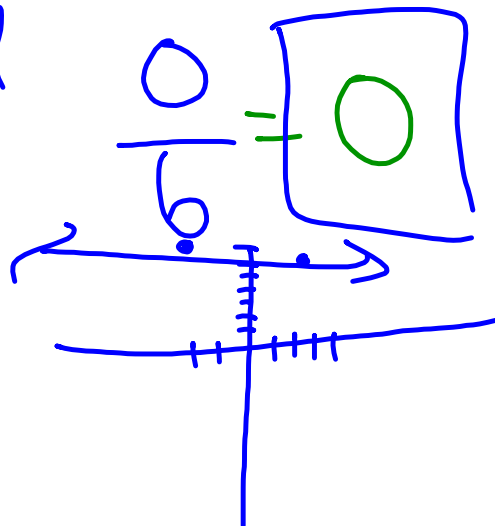
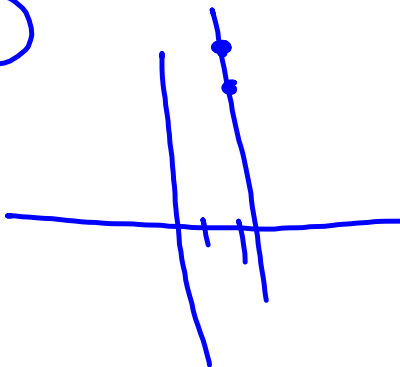


4. (-2, 7) and (4, 7)

x, y



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



Extra practice if needed

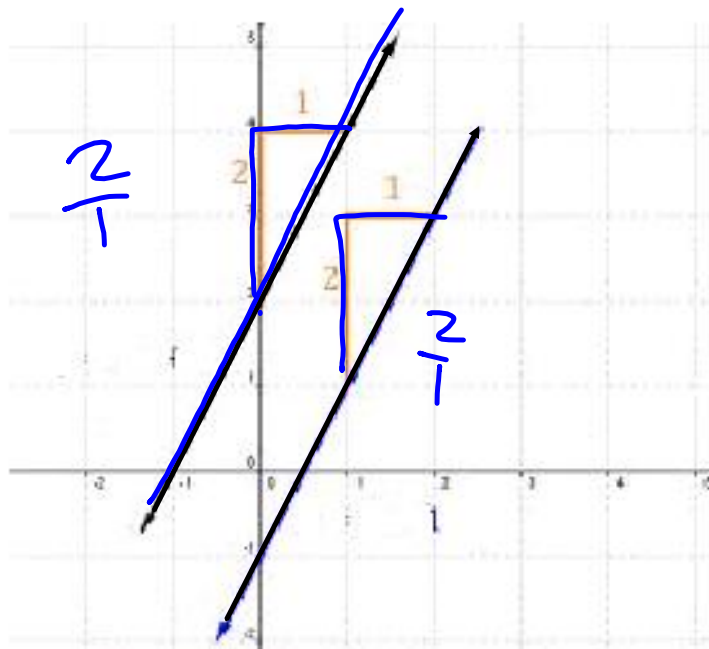
$$(3,7) \text{ and } (5,10) \quad \frac{3-7}{2-5} = \frac{-4}{-3} = \frac{4}{3}$$

$$(-1,4) \text{ and } (3,3) \quad \frac{-1-4}{3-3} = \frac{-5}{0} = \text{undefined}$$

$$(0,0) \text{ and } (-2,5) \quad \frac{0-0}{-2-0} = \frac{0}{-2} = 0$$

$$(-1,-5) \text{ and } (-4,-5) \quad \frac{-1-(-5)}{-4-(-5)} = \frac{4}{1} = 4$$

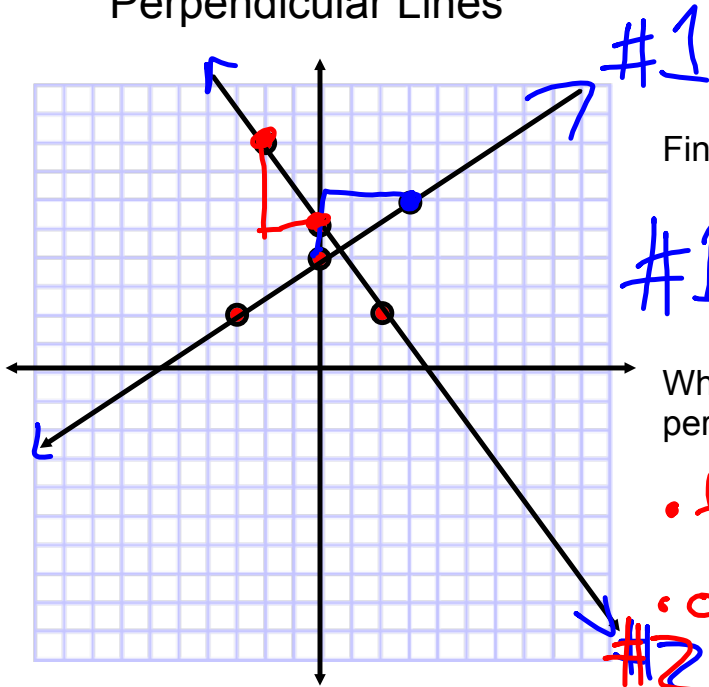
Parallel Lines



What do you notice about the slope of parallel lines?

Same slope

Perpendicular Lines



Find the slope of both lines.

$$\#1: \frac{2}{3} \quad \#2: -\frac{3}{2}$$

What do you notice about the slope of perpendicular lines?

- flip (Reciprocal)
- opposite signs

Practice finding a perpendicular slope of the given slope

$$m = 1/2 \quad -\frac{2}{1}$$

$$m = 4/3 \quad -\frac{3}{4} \quad kd$$

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

$$m = -2/3 \quad 3/2$$

$$m = \frac{-2}{1} \quad 1/2$$

$$m = -5/2 \quad 2/5$$

