What's Going On?

Checking In

Minds on Parallel and Perpendicular Basics

Action! Parallel and Perpendicular Lines

Consolidation Whiteboards

Learning Goal - I will be able to identify equations that represent parallel and perpendicular lines.

L.G.L.

1. Determine the intercepts of the line below.
2. Use the intercepts to determine the slope of the line.

$$-2x + 4y = 20$$

1. x-intercept

$-2x + 4y = 20$

$-2 \quad -2$

$x = -10$

y-intercept

$-2x + 4y = 20$

$4 \quad 4$

$y = 5$

2. $(-10, 0)$ $(0, 5)$

$x_1 \; y_1$ $x_2 \; y_2$

$$m = \frac{5 - 0}{0 - -10}$$

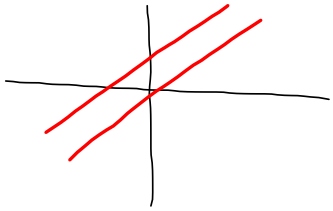
$$m = \frac{5}{10} = \frac{1}{2}$$

$$y = \frac{1}{2}x + 5$$

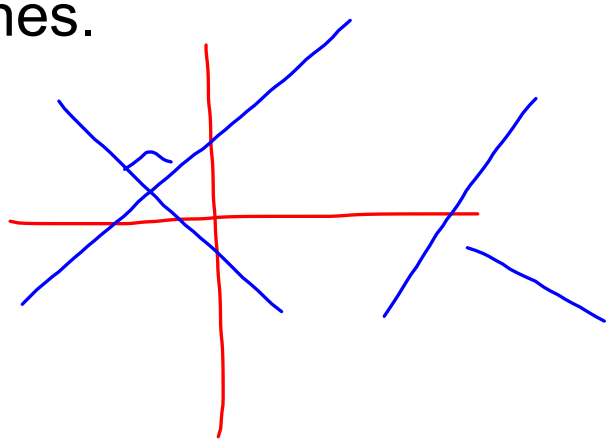
Minds on

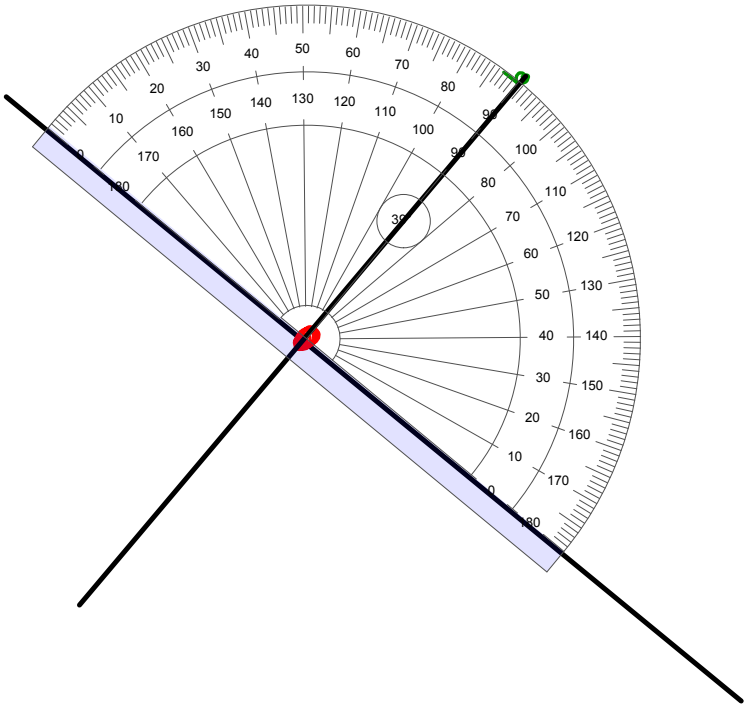
Parallel and Perpendicular Basics

On the graph side of your whiteboard, draw a pair of parallel lines.



On the graph side of your whiteboard, draw a pair of perpendicular lines.




10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
36

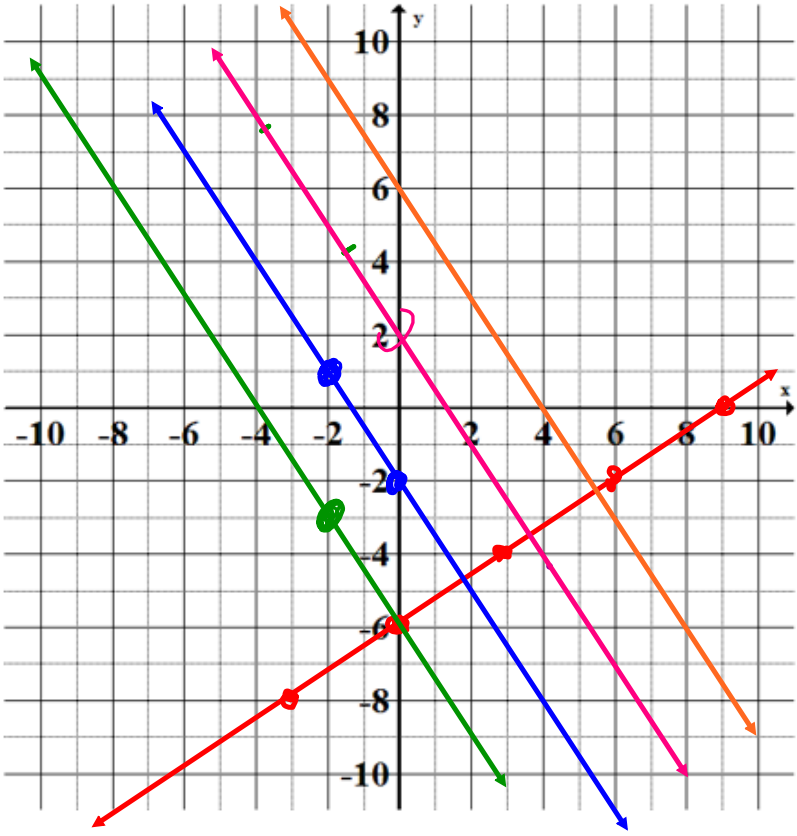
Action!

Parallel and Perpendicular Lines

Work with a partner to complete your graphing "investigation".

Compare your answers with another pair of students.

Sketch the line $y = \frac{2}{3}x - 6$, then sketch a line perpendicular.



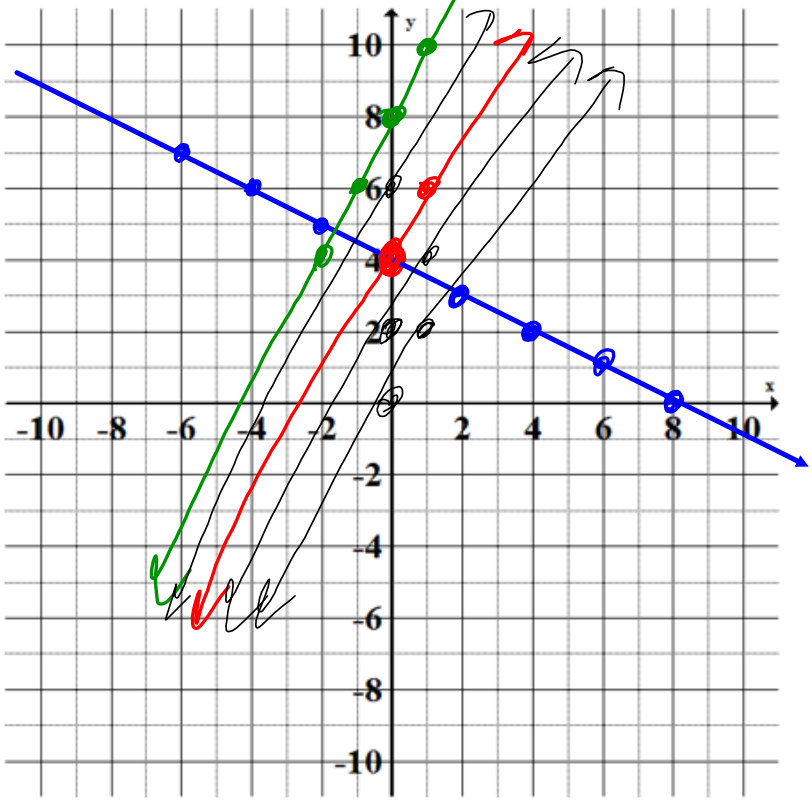
$y = \frac{-3}{2}x - 6$

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

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

$y = \frac{-3}{2}x + 6$

Sketch the line $y = -\frac{1}{2}x + 4$, then sketch a line perpendicular.



$y = \frac{2}{1}x + 8$

$y = 2x + 4$

$y = 2x + 2$

Action!

Parallel and Perpendicular Lines

Complete the following sentences:

The slope of a line parallel to $y = \frac{4}{5}x + 7$ is $\frac{4}{5}$

The slope of a line perpendicular to $y = \frac{2}{9}x - 8$ is $-\frac{9}{2}$

Action!

Parallel Pairs

Two lines are parallel if they have the same slope

$y=3x-4$ AND $y=3x+6$

$y=5$ AND $y=-6$

$y=-\frac{2}{3}x+1$ AND $y=\frac{2}{3}x-5$

Action!

Perpendicular Pairs

Two lines are perpendicular if they meet at a 90° angle. Their slopes are ***negative reciprocals*** of one another.

$$y = \frac{2}{3}x + 3 \quad \text{AND} \quad y = -\frac{3}{2}x - 6$$

$$y = \frac{1}{2}x - 4 \quad \text{AND} \quad y = -2x + 5$$

$$y = -x + 2 \quad \text{AND} \quad y = x - 5$$

"change the sign and switch it"

Action!

Negative Reciprocals

To find the **negative reciprocal** of a fraction, simply flip the fraction and change the sign!

$\frac{2}{3} \rightarrow \frac{-3}{2}$	$\frac{-3}{7} \rightarrow \frac{7}{3}$
$\frac{-1}{5} \rightarrow \frac{5}{1}$	$4 \rightarrow \frac{-1}{4}$

$0 \rightarrow$ undefined

When you find the slope of a perpendicular line, the signs change **and** the rise becomes the run and the run becomes the rise!!

slope ⊥ slope

$\frac{3}{5}$ $-\frac{1}{6}$

$\frac{1}{1}$ -1

$-\frac{7}{7}$ 0

Consolidation

Plan it Out!

For each question

1. Write out a plan of how you will solve it.
   - You don't need to be specific here.
   - Think big picture plan.
2. Use your plan to answer the question.