

What's Going On?

Checking In

Minds on

Recap.

Action!

Classroom Tour

Consolidation

Whiteboards!

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

Minds on

Recap.

Find the slope and y-intercept of the line in standard form below.

$$2x + 3y - 15 = 0$$

1. First, we move every term except the term with the y in it to the **right side**.

$$\begin{array}{r} 2x + 3y - 15 = 0 \\ -2x \quad +15 \quad -2x + 15 \\ 3y = -2x + 15 \end{array}$$

2. Next, we divide every term by the **coefficient on y** to get y by itself.

$$\frac{3y}{3} = \frac{-2x}{3} + \frac{15}{3}$$

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

3. The number that is being multiplied by x is our slope.
The constant is our y-intercept.

$$m = -\frac{2}{3}, \quad b = 5$$

Minds on

Recap.

Find the x-intercept and y-intercept of the line in standard form below.

$$2x + 3y - 15 = 0$$

To find the x-intercept

1. Sub in 0 for y.

$$2x + 3(0) - 15 = 0$$

$$2x - 15 = 0$$

2. Solve for x. (Write as decimal)

$$2x - 15 = 0$$

$$+15 \quad +15$$

$$\frac{2x}{2} = \frac{15}{2}$$

$$x = \frac{15}{2} \text{ or } 7.5$$

To find the y-intercept

1. Sub in 0 for x.

$$2(0) + 3y - 15 = 0$$

$$3y - 15 = 0$$

2. Solve for y. (Write as decimal)

$$3y - 15 = 0$$

$$+15 \quad +15$$

$$\frac{3y}{3} = \frac{15}{3}$$

$$y = 5$$

When we write **slopes**
ALWAYS leave as a **fraction!**

This allows for easier graphing! (rise/run)

When we write **intercepts**
Write as a whole number or **decimal.**

This allows for easier graphing!

Action!

Classroom Tour

Take your handout and "tour the classroom"

When you find a set of *parallel lines* write the equations or sketch the graphs in the **left table**.

When you find a set of *perpendicular lines* write the equations or sketch the graphs in the **right table**.

When you are done, sit down and look at what you found.

With a partner, try and figure out what it means for lines to be *parallel* or *perpendicular*.

Action!

Classroom Tour

Parallel Pairs

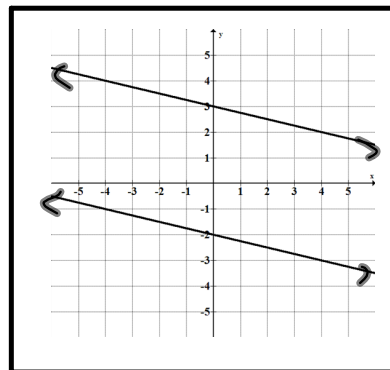
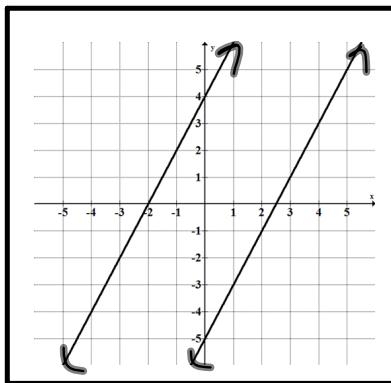
$$y = 3x - 4 \quad \text{AND} \quad y = 3x + 6$$

$$y = 2x - 3 \quad \text{AND} \quad 6x - 3y - 9 = 0$$

$m = 2$

$$y = 5 \quad \text{AND} \quad y = -6$$

$m = 0$ $m = 0$



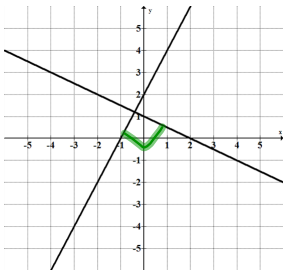
Two lines are parallel if they have the same slope

Action!

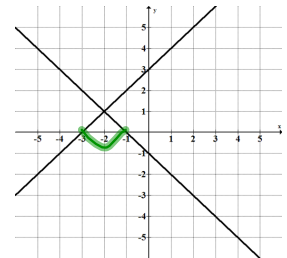
Classroom Tour

Perpendicular Pairs

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



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



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

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

Action!

Negative Reciprocals

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

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

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



Consolidation**Whiteboards!**

Write the equation of a line parallel to

$$y = 3x + 1 \quad m=3$$

$$y = 3x - 1$$
$$y = 3x + 2$$
$$y = 3x + 3$$
$$y = 3x$$

$$y = 3x - 592$$

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Write the equation of a line **parallel** to

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

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

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Write the equation of a line **parallel** to

$$y = 8$$

$$y = \pm \#$$

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Write the negative reciprocal of

$$\frac{2}{3}$$

$$-\frac{3}{2}$$

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Write the negative reciprocal of

$$\frac{-3}{7}$$

$$\frac{7}{3}$$

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Write the negative reciprocal of

$$\frac{1}{3}$$

$$-3$$

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Write the negative reciprocal of

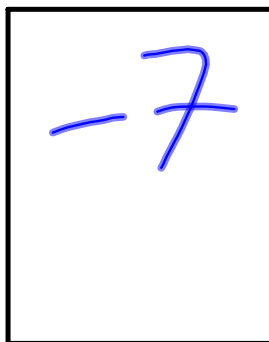
$$\frac{6}{1}$$

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

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Write the negative reciprocal of

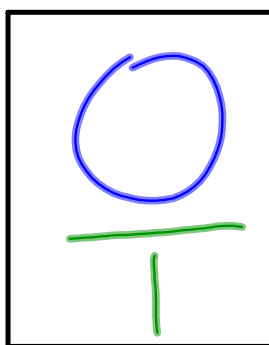

$$-7$$


$$\frac{1}{7}$$

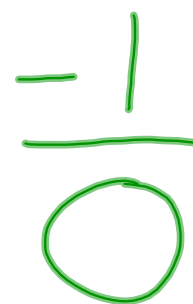
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Write the negative reciprocal of


$$\frac{\bigcirc}{|}$$

undefined


$$\frac{-}{\bigcirc}$$

"error"

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Whiteboards!

Write the equation of a line **perpendicular** to

$$y = \frac{2}{3}x + 4$$

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

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Write the equation of a line **perpendicular** to

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

$$y = \frac{5}{3}x + 7$$

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Write the equation of a line **perpendicular** to

$$y = 3x - 2$$

$$y = -\frac{1}{3}x + 6$$

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Whiteboards!

Write the equation of a line **perpendicular** to

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

$$y = -2x + 7$$

Consolidation

Whiteboards!

Write the equation of a line **perpendicular** to

$$y = 3$$

$$x = \#$$

Consolidation

Practice it!

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