Equations for a Line

- Slope-Intercept Form y = mx + b
- Standard Form Ax + By = C
- Point-Slope Form $y y_1 = m(x x_1)$
- Horizontal Lines y = #
- Vertical Lines x = #

Sec 6-5: Parallel and Perpendicular Lines

Two lines are Parallel if they:

- Have the same slope
- Different y-intercepts

Two lines are Perpendicular if they:

- Have opposite reciprocal slopes
- y-intercepts don't matter

	Opposite Reciprocal	Opposite Reciprocal	
-9	19	-3.5 <u>10</u> 35 7	31/2 = 7
1 7	<u>-7</u>	0.73 \ 100	

How do you tell if numbers are opposite reciprocals?

Is each pair of numbers opposite reciprocals?

and
$$-0.6 = -\frac{6}{5}$$

1.6 and
$$-0.625$$

The product of any number and its reciprocal is

$$\frac{5}{5} \cdot \frac{2}{5} = 1$$

The product of OPPOSITE RECIPROCALS is

$$\frac{5}{2} \cdot \frac{-2}{5} = -1$$

Is each pair of lines parallel?

1.
$$y = -2x + 4$$
 $m = -2$ 2. $y = 3x - 7$ $m = 3$ $y = -2 + 4x$ $m = 4$ $y = 3$

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Slopes aren't the same

3.
$$y = -\frac{1}{2}x + 7$$

3.
$$y = -\frac{1}{2}x + 7$$
 $y = -\frac{1}{2}x + 7$ $y = 6x - 1$

Yes: $4x + 8y = 24$ $y = 6x - 1$

Slopes are equal and y-int are different

Slopes aren't the same

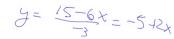
Is each pair of lines perpendicular?

$$1. \ y = 3x - 8$$
$$y = -3x + 5$$

slopes aren't opposite reciprocals

3.
$$y = 2x - 5$$

6x - 3y = 15



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

 $y = \frac{1}{4}x - 2$
Slopes aren't opposite reciprocals

4.
$$y = 9$$
 Horizon $x = 9$ Yert YES

Tell if each pair of lines are parallel, perpendicular, or neither.

1.
$$y = 1.5x + 8$$
 $m = 1.5 = \frac{3}{2}$ $y = 6x - 7$ $m = 6$ $b = -7$ $y = -\frac{2}{3}x + 6$ $m = -\frac{2}{3}$ $24x - 4y = 28$ $m = 6$ $b = -7$ $y = \frac{28 - 34x}{-4}$

Slopes are Opposite Reciprocals so the lines are Perpendicular

= -7 +6x these are the same line so the can't

be parallel or perpendicular

Neither

Tell if each pair of lines are parallel, perpendicular, or neither.

3.
$$y = x + 3$$
 $m = (= -\frac{1}{2})$ $y = -8x + 3$

Slopes are Opposite Reciprocals so the lines are Perpendicular

$$y = -8x + 3$$

$$y = x + 3 \quad m = (= -1) \quad y = -8x + 3 \quad b = 3$$

$$y = -x - 5 \quad m = -1 = -1 \quad 16x + 2y = 11 \quad m = -8$$

$$-16x + 2y = 11 - 16x \quad b = 1/2$$

$$y = -16x + 3 \quad b = 1/2$$

$$y = -16x + 3 \quad b = 1/2$$

Same Slope but different y-intercept:

Lines area Parallel

Use this equation:

$$y = 4x - 9$$
 $//$ = 4

Write the equation of a line that is parallel to this line and passes through the point (5.1)

m=4

$$\mathcal{J}^{-1} = \mathcal{L}(x-5)$$

Write the equation of a line that is perpendicular to this line and passes through the point (-8, 7)

 $\mathcal{J}-7 = -\frac{1}{4}(x+s)$

M= - 1/4

Use this equation:

$$6x + 3y = 12$$

$$6x + 3y = 12
-6x
3y = 12-6x
3y = 4-2x
m = -2$$

Write the equation of a line that is parallel to this line and passes through the point (-7,4)

$$y-y = -2(x+7)$$

Write the equation of a line that is perpendicular to this line and passes through the point (4, 10)

Use this equation:

Write the equation of a line that is parallel to this line and passes through the point (13, -8)

$$y = -8$$

Write the equation of a line that is perpendicular to this line and passes through the point (-2, -7)