#### Sec 6-5: Parallel and Perpendicular Lines

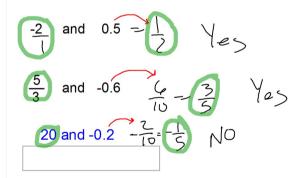
Two lines are Parallel if they:

- Have the same slope
- Different y-intercepts

Two lines are Perpendicular if they:

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

Is each pair of numbers opposite reciprocals?



Find the opposite reciprocal of each number:

	Opposite Reciprocal		Opposite Reciprocal
7	- 1	2.5 \$\frac{1}{2} = \frac{5}{2}\$	- <del>2</del> 5
- <u>1</u>	+7003	- 0.63 - حمل - الان	+ 100

Write down two numbers that are just Reciprocals.

Multiply these together. What is the result?

The product of any number and its reciprocal is

The product of OPPOSITE RECIPROCALS is

## Is each pair of lines parallel?

1. 
$$y = -2x + 4$$
  $m = -2$  NOT //

Lines have different

#### Is each pair of numbers Opposite Reciprocals?

100 and 0.01 NO, they're both pos  
8 and -0.15 
$$\rightarrow S(-.15) = -1.2 \neq -1$$
 NO  
3.2 and -0.3125  $(3.2)(-0.3125) = -1.405$ 

## Is each pair of lines parallel?

2. 
$$y = 3x - 7$$
  $m = 3$   $v = 3$ 

Lines have different

#### Is each pair of lines parallel?

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

$$m=-1/2$$

$$4x + 8y = 24$$

$$-4 \times \qquad -4 \times$$

these lines have the same slope but different y-intercepts so they

$$\frac{8y - 24 - 4x}{8}$$

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

# Is each pair of lines perpendicular?

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

these lines don't have opposite reciprocal slopes,

#### Is each pair of lines parallel?

4. 
$$y = 6x - 1$$
  $m = 6$ 

these lines have different slopes.

$$6x - 2y = 8$$

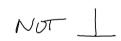
$$= 2x = 8 = 6x$$

$$\frac{-2y-8-6x}{-2}$$

# Is each pair of lines perpendicular?

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

$$y = \left(\frac{1}{4}\right)x - 2$$



these lines don't have opposite reciprocal slopes,

## Is each pair of lines perpendicular?

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

$$6x - 3y = 15$$

$$-6x$$

$$-3y = 15$$

$$-3y = 15 - 6x$$

these lines don't have opposite reciprocal

#### Parallel, Perendicular, or Neither?

1. 
$$y = 1.5x + 8$$
 These lines have slopes that are opposite reciprocals,

They are perpendicular

#### Is each pair of lines perpendicular?

4. 
$$y = 9$$
 Horiz  
 $x = 9$  Vertical  $y = 1$ 

#### Parallel, Perendicular, or Neither?

$$y = 6x - 7$$

$$24x - 4y = 28$$

$$-24x - 4y = 28$$

$$-24x - 24x - 24x$$

$$-4x - 24x$$

$$-4x - 24x - 24x$$

$$-4x - 24x$$

$$-5x - 24x$$

these lines have the same slope and y-intercept, they are Neither

3. Parallel, Perendicular, or Neither?

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

Lines are Perpendicular

$$y = -x - 5 \qquad m = -1$$

these are opposite reciprocals!

Parallel, Perendicular, or Neither?

$$y = -8x + 3$$

$$16x + 2y = 11$$

$$m = -8$$

$$\downarrow_2 = 3$$

$$16x + 2y = 11$$

$$y = \frac{11 - 16x}{2}$$

$$y = \frac{11}{2} - 8x \qquad b = \frac{11}{2}$$

These lines have the same slope but different y-intercepts

Lines are Parallel