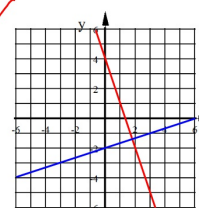## Equations for Lines:

- Slope-Intercept Form $\quad y = mx + b$

- Point-Slope Form $\quad y - y_1 = m(x - x_1)$

- Standard Form $\quad Ax + By = C$

- Horizontal Lines $\quad y = \#$

- Vertical Lines $\quad x = \#$

2. Graph each pair of lines together.
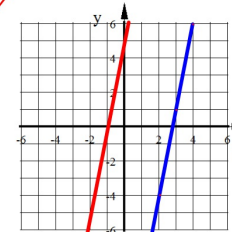
a) $y = -3x + 4 \qquad 12x - 36y = 72$

b) $20x - 4y = -20 \qquad y + 4 = 5(x - 2)$

$y = -3x + 4$

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

Perpendicular Lines

$y = 5x + 5$

$y = 5x - 14$

Parallel Lines

Parallel Lines:

Parallel Lines:

Two lines are parallel if: they never intersect

Equations of Parallel Lines:

Two equations represent Parallel Lines if:
- They have the SAME slope
- But, different y-intercepts

Symbol for Parallel: $\parallel$

Perpendicular Lines:

Perpendicular Lines:

Two lines are perpendicular if: they intersect and form a right angle.

Equations of Perpendicular Lines:

Two equations represent Perpendicular Lines if:
- They have the Opposite Reciprocal slopes
- Y-intercept----DOESN'T MATTER

Symbol for Perpendicular: $\perp$

Given this line: y = 4x - 9

1. Write the equation of the line that is (Parallel) to this line and passes through the point (-5,3).

$m = 4$

$$y - 3 = 4(x + 5)$$

must be the same slope

2. Write the equation of the line that is (Perpendicular) to this line and passes through the point (12,-1).

$m = -\frac{1}{4}$

$$y + 1 = -\frac{1}{4}(x - 12)$$

slope must be opposite reciprocal

Given this line: y = 7 ⟶ this line is Horizontal

1. Write the equation of the line that is (Parallel) to this line and passes through the point (13,8).

this new line must be Horizontal too!

y = 8

2. Write the equation of the line that is (Perpendicular) to this line and passes through the point (-4,9).

this line must be Vertical

x = -4

Determine if each pair of lines is Parallel, Perpendicular, or Neither.

1. $m = 1.5 = 1\frac{1}{2} = \frac{3}{2}$

$y = 1.5x + 8$

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

⊥

Slopes are opposite reciprocals

2.

$y = 6x - 7$ $m = 6$
                   $b = -7$

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

$$y = \frac{28 - 24x}{-4}$$

$m = 6$
$b = \frac{28}{-4} = -7$

Neither

Slopes and y-int are the same these are the same line.

Determine if each pair of lines is Parallel, Perpendicular, or Neither.

3.

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

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

$(1)(-1) = -1$

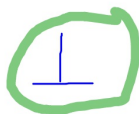since the product of the slopes is -1 they must be opposite reciprocals.

⊥

4.

$y = -8x + 3$ $m = -8$
                  $b = 3$

$16x + 2y = 11$ m

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

$m = -8$
$b = \frac{11}{2}$

Slopes are the same but y-int are different.

||

Determine if each pair of lines is Parallel, Perpendicular, or Neither.

5.
$y = 9$ Horiz
$x = 9$ Vert

⊥

6.
$y = 4x + 20$ $m = 4$
$y = \frac{1}{4}x - 2$ $m = \frac{1}{4}$

Neither

Slopes aren't the same nor are they opposite reciprocals

Determine if each pair of lines is Parallel, Perpendicular, or Neither.

7. $m = 2$ $y = 2x$ Not Horiz or Vert
$m = 0$ $y = 2$ Horiz

Neither

Slopes aren't the same nor are they opposite reciprocals

8.
$y = -2x + 4$ $m = -2$
$y = -2 + 4x$ $m = 4$

Neither

Slopes aren't the same nor are they opposite reciprocals

Hwk #10   Sec 2-2

Page 68   **Due Tomorrow**

Problems 28, 29, 33, 36-41, 60

Don't graph the lines for 38-41