

**Key**

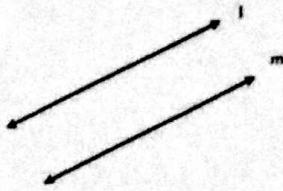
### Parallel and Perpendicular Lines Guided Notes

Parallel Lines: Two lines on a plane that never meet. Always the same distance apart.

Parallel Lines have the same slope

$$y = 2x + 7$$

$$y = 2x - 4$$



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

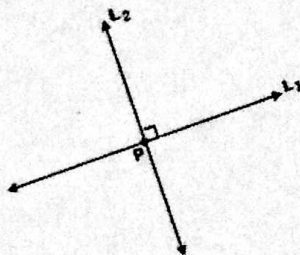
$$y = -1/3x - 5$$

Perpendicular Lines: A line is  $\perp$  to another line if two lines intersect at a right angle.

Perpendicular Lines have the opposite reciprocal slopes!

$$y = 2x + 7$$

$$y = -1/2x - 4$$



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

$$y = 3x - 5$$

Determine whether the graphs of each pair of equations are parallel, perpendicular, or neither

1)  $y = -x - 1$  and  $x + y = -1$   
 $y = -x - 1$

neither, same line

2)  $y = \frac{3}{7}x - 4$  and  
 $y = \frac{7}{3}x + 5$

neither

3)  $y = \frac{-2}{5}x - 14$  and

$$-5x + 2y = 6$$

$$2y = 5x + 6$$

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



Write an equation in slope intercept form of the line that is parallel to the graph of each equation and passes through the given point  $y = mx + b$

1)  $y = -3x - 15$  and  $(5, -5)$

$$-5 = -3(5) + b$$

$$-5 = -15 + b$$

$$-10 = b$$

$$y = -3x - 10$$

2)  $(-2, -3)$  and  $-6x + 4y = -12$

$$4y = 6x - 12$$

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

$$-3 = \frac{3}{2}(-2) + b$$

$$-3 = -3 + b$$

$$0 = b$$

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

3)  $y = 3x - 4$  and  $(4, 1)$

$$1 = 3(4) + b$$

$$1 = 12 + b$$

$$-11 = b$$

$$y = 3x - 11$$

Write an equation in slope intercept form of the line that is perpendicular to the graph of each equation and passes through the given point  $y = mx + b$

1)  $y = -3x - 15$  and  $(1, 0)$

$$0 = \left(\frac{1}{3}\right)(1) + b$$

$$0 = \frac{1}{3} + b$$

$$-\frac{1}{3} = b$$

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

2)  $-x + 2y = -20$  and  $(0, 5)$

$$2y = x - 20$$

$$y = \frac{1}{2}x - 10$$

$$m_2 = -2$$

$$5 = -2(0) + b$$

$$5 = b$$

$$y = -2x + 5$$

3)  $y = -3x - 3$  and  $(2, -2)$

$$m_2 = \frac{1}{3}$$

$$-2 = \frac{1}{3}(2) + b$$

$$-2 = \frac{2}{3} + b$$

$$-\frac{8}{3} = b$$

$$y = \frac{1}{3}x - \frac{8}{3}$$