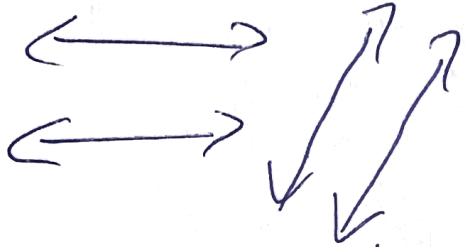


Names \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

# Parallel and Perpendicular lines.

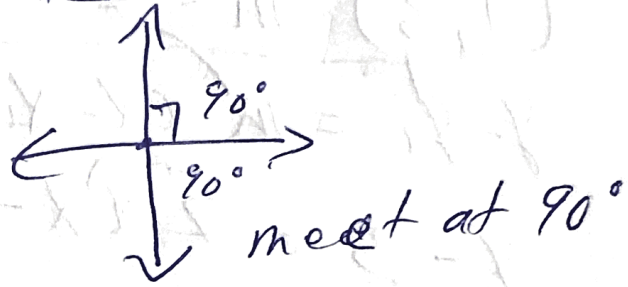


Never meet..

$$y = 2x + 3$$

$$y = 2x + 5$$

Parallel lines have the same slope  $\frac{2}{1}$



$$y = 2x + 3$$

$$y = -\frac{1}{2}x - 5$$

→ reciprocal perpendicular lines have opp. reciprocal slopes

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

1) Write a line that is parallel to the given line and passes to the given point  $(3, 1)$  ;  $y = 2x + 4$ .

$(3, 1)$   $m = 2$

$$y - y_1 = m(x - x_1)$$

$$y - 1 = 2(x - 3)$$

$$y - 1 = 2x - 6$$

$$\begin{array}{r} y - 1 \\ + 1 \\ \hline y = 2x - 5 \end{array}$$

$$y = 2x - 5$$

$$2) (1, 3): y = 7x + 5$$

$$(1, 3) \quad m = 7$$

$$y - y_1 = m(x - x_1)$$

$$y - 3 = 7(x - 1)$$

$$y - 3 = 7x - 7$$

$$y = 7x - 4$$

3)

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

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

perpendicular

$$\frac{5}{7} = -\frac{1}{5}$$

5)

$$y = 4x + 5$$

$$y = 4x - 3$$

parallel

4)

$$y = 12x + 5$$

$$y = -12x + 6$$

neither.

$$6) y = \frac{2}{3}x + 7$$

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

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

perpendicular.

5)  $(4, 8)$

~~$y = -2x - 4$~~   
 $y = -2x - 4$

slope

$-\frac{2}{1}$

$\frac{1}{2}$

$(4, 8)$   $m = \frac{1}{2}$   
 $y - y_1 = m(x - x_1)$

$y - 8 = \frac{1}{2}(x - 4)$

$y - 8 = \frac{1}{2}x - 2$   
+8 +8

$y = \frac{1}{2}x + 6$

perpendicular lines.

6)  $(5, 3)$ ;  $y = 5x + 2$

$(5, 3)$   $m = -\frac{1}{5}$   
 $y - y_1 = m(x - x_1)$

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

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

$y = -\frac{1}{5}x + 4$

slope perpendicular slope  
 $\frac{5}{1}$   $-\frac{1}{5}$

6)  $(5, -3)$   $y = 5x + 3$  Line perpendicular.

$(5, -3)$   $m = -\frac{1}{5}$   
 $y - y_1 = m(x - x_1)$   
 $y - (-3) = -\frac{1}{5}(x - 5)$   
 $y + 3 = -\frac{1}{5}x + 1$   
 $y = -\frac{1}{5}x - 2$

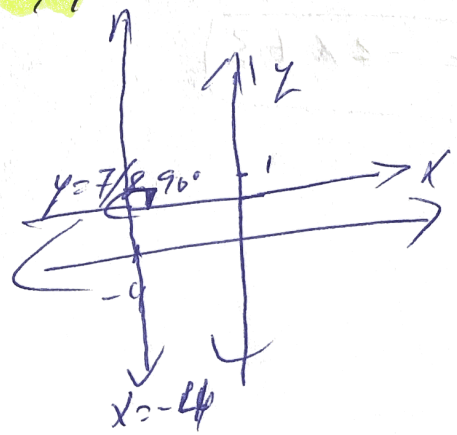
Standard form  
 $Ax + By = C$   
 $-4x + y = -13$   
 $+4x$   $+4x$

7)  $y = 4x + 5$   $y = 4x - 13$

parallel

8)  $y = \frac{7}{9}x - 7$   $y = \frac{7}{9}x + 3$   
neither

9)  $y = \frac{7}{8}$   $x = -4$   
zero slope undefined.  
perpendicular



10)

$$y = -6x - 8$$

$$\begin{array}{r} -x + 6y = 12 \\ +x \end{array}$$

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

$$\frac{6y}{6} = \frac{1x + 12}{6}$$

$$y = \frac{1}{6}x + 2$$

perpendicular.

(2, -1)  $y = -2x + 1$  parallel line.

parallel  $m = -2$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - (-1) &= -2(x - 2) \\ y + 1 &= -2x + 4 \\ y &= -2x + 3 \end{aligned}$$

parallel

$$y = -2x + 3$$

perpendicular

(2, -1)  $y = \frac{1}{2}x + 1$

(2, -1)  $m = \frac{1}{2}$

$$y - y_1 = m(x - x_1)$$

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

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

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

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

perpendicular.



$$7) y = 4x + 5$$

$$\begin{array}{r} -4x + y = -13 \\ +4x \quad \quad +4x \end{array}$$

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$$y = 4x - 13$$

Parallel

same slope

$$8) y = \frac{7}{9}x - 7$$

$$y = -\frac{7}{9}x + 3$$

neither.

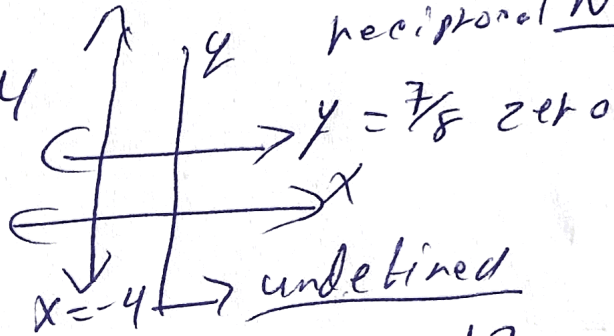
opp - yes

reciprocal NO

$$9) y = \frac{7}{8}$$

$$x = -4$$

perpendicular.



10)

~~$$y = -6x - 8$$~~

$$y = -6x - 8$$

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

$$m = \frac{1}{6}$$

perpendicular  $y = \frac{1}{6}x + 2$

$$\begin{array}{r} -x + 6y = 12 \\ +x \quad \quad +x \end{array}$$

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$$\frac{6y}{6} = \frac{x + 12}{6}$$