

HW: Worksheet/1-15, 35-37, 40, 41

**Warm up:**

Graph

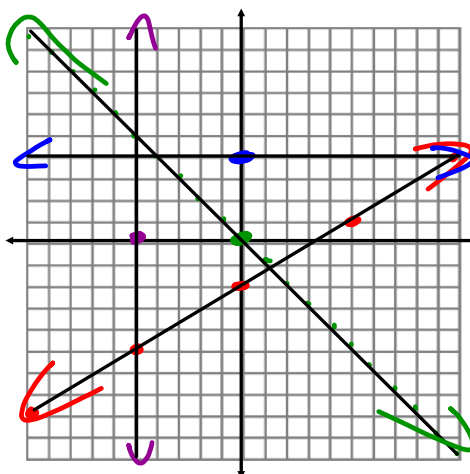
1)  $y = -x$



2)  $y = (3/5)x - 2$

3)  $y = 4$

4)  $x = -5$



## HW Solutions

$$(10) \quad (9, -2) \quad (4, 3)$$

$$\frac{\Delta y}{\Delta x} = \frac{3 - (-2)}{4 - 9} = \frac{5}{-5} = -1$$

$$y = -x + b$$

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

$$3 = -4 + b$$

$$\begin{array}{r} +4 \quad +4 \\ \hline 7 = b \end{array}$$

$$y = -x + 7$$

$$(18) (-5, 3) (0, -7)$$

$$\frac{\Delta y}{\Delta x} = \frac{3 - (-7)}{-5 - 0} = \frac{10}{-5} = -2$$

$$y = 2x + b$$

$$3 = -2(-5) + b$$

$$\begin{array}{r} 3 = 10 + b \\ -10 \quad -10 \\ \hline -7 = b \end{array}$$

$$y = -2x - 7$$

$$Q2 \quad (-1, -3) \quad (-2, 3)$$

$$\frac{\Delta y}{\Delta x} = \frac{3 - (-3)}{-2 - (-1)} = \frac{6}{-1} = -6$$

$$y = -6x + b$$

$$-3 = -6(-1) + b$$

$$-3 = 6 + b$$

$$\begin{array}{r} -6 \\ -6 \\ \hline -9 = b \end{array}$$

$$y = -6x - 9$$

$$Q2 \quad (-2, -4) \quad (2, 4)$$

$$\frac{\Delta y}{\Delta x} = \frac{-4 - 4}{-2 - 2} = \frac{-8}{-4} = 2$$

$$y = 2x + b$$

$$4 = 2(2) + b$$

$$4 = 4 + b$$

$$\begin{array}{r} -4 - 4 \\ \hline 0 = b \end{array}$$

$$y = 2x$$

$$(19) (3, 5) (2, -2)$$

$$\frac{\Delta y}{\Delta x} = \frac{5 - (-2)}{3 - 2} = \frac{7}{1} = 7$$

$$y = 7x + b$$

$$5 = 7(3) + b$$

$$5 = 21 + b$$

$$\begin{array}{r} -21 \\ -21 \\ \hline \end{array}$$

$$-16 = b$$

$$y = 7x - 16$$

15

$$y = 2x + b$$

$$6 = 2(2) + b$$

$$6 = 4 + b$$

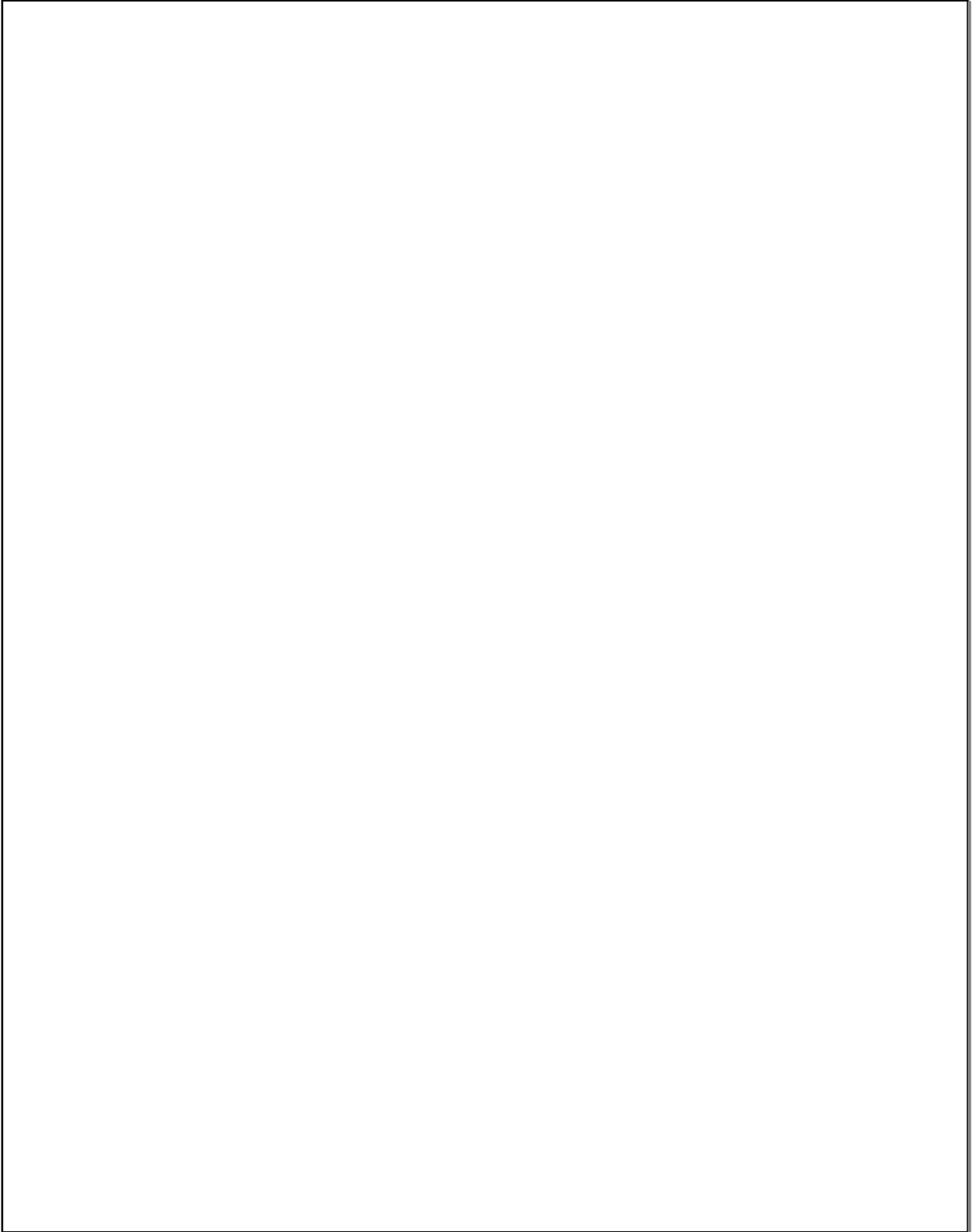
$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$2 = b$$

(2, 6)

$$y = 2x + 2$$

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Graph  $y = 3x + 2$

Plot the point  $(0,8)$

Draw a parallel line through that point.

What is the function?

What do you notice about parallel lines?

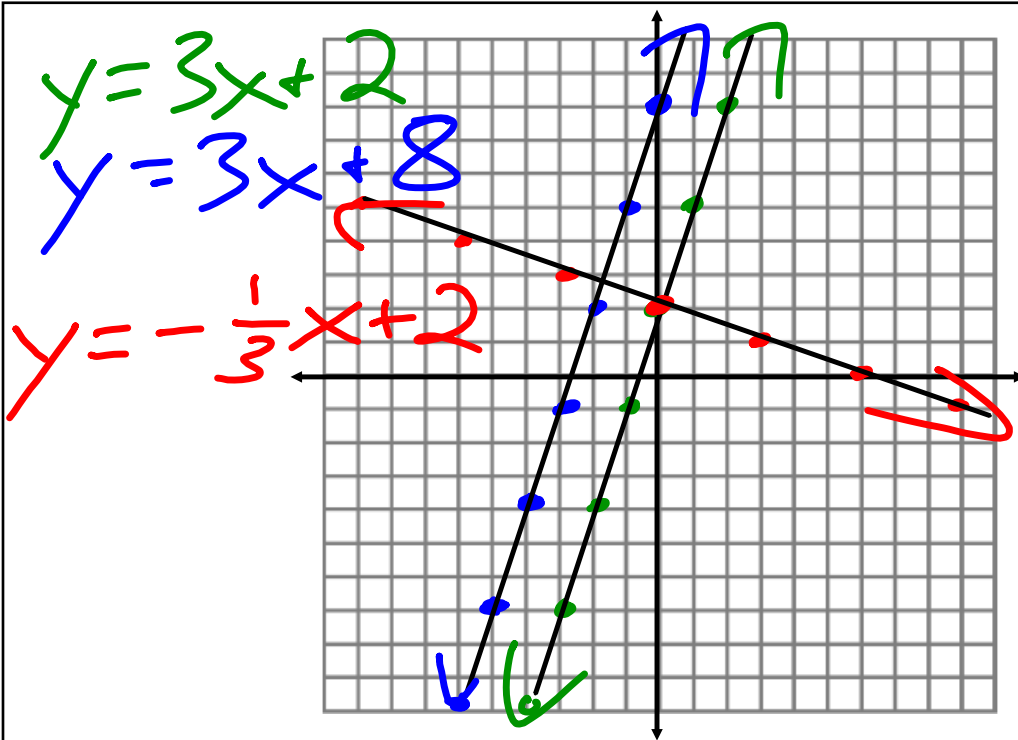
*same slope*

Looking back at the original line, draw a perpendicular line through  $(0,2)$

What is the function?

What do you notice about perpendicular lines?

*slope is the opposite  
reciprocal*



What is the slope of the line parallel to...

1)  $y = (3/4)x$

$\frac{3}{4}$

3)  $y = x - 8$

1

2)  $y = -5x + 4$

-5

4)  $y = 5$

0

What is the slope of the line perpendicular to...

1)  $y = (5/8)x$

$-\frac{8}{5}$

3)  $y = -x + 2$

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

2)  $y = -2x - 7$

$\frac{1}{2}$

4)  $y = -4$

undefined

## Symbols for Parallel and Perpendicular

||

⊥

a||b

Write a function for the line with y-intercept 4  
that is parallel to  $y = -8x + 5$ .

$$y = -8x + 4$$

Write a function for the line through  $(-6, 3)$  that is perpendicular to  $y = 2x - 7$ .

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

$$3 = -\frac{1}{2}(-6) + b$$

$$\begin{array}{r} 3 = 3 + b \\ -3 \quad -3 \\ \hline 0 = b \end{array}$$

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

# Survey

Write a function based on the information given.

1) The line through  $(3,5)$  that is parallel to  $y = -2x$

2) The line through  $(-4, 7)$  that is perpendicular to  $y = (3/5)x + 9$

3) The line with x-intercept 5 that is parallel to  $y = (4/5)x$

4) The line with y-intercept -7 that is perpendicular to  $y = -(2/3)x + 12$

5) The line perpendicular to  $y = 3$  through the point  $(-5, -9)$ .



1) The line through (3,5) that is parallel to  $y = -2x$

$$\begin{aligned}y &= -2x + b \\5 &= -2(3) + b \\5 &= -6 + b \\+6 & \quad +6 \\ \hline 11 &= b\end{aligned}$$

$$y = -2x + 11$$

2) The line through  $(-4, 7)$  that is perpendicular to  $y = (3/5)x + 9$

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

$$7 = -\frac{5}{3}(-4) + b$$

$$\frac{21}{3} = 7 = \frac{20}{3} + b$$

$$\frac{21}{3} - \frac{20}{3} = \frac{20}{3} - \frac{20}{3} + b$$

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

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

3) The line with x-intercept 5 that is parallel to  
 $y = (4/5)x$

$(5, 0)$

$$y = \frac{4}{5}x + b$$

$$0 = \frac{4}{5}(5) + b$$

$$0 = 4 + b$$

$$\begin{array}{r} -4 \quad -4 \\ \hline -4 = b \end{array}$$

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

4) The line with y-intercept -7 that is  $(0, -7)$  perpendicular to  $y = -(2/3)x + 12$

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

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

5) The line perpendicular to  $y = 3$  through the point  $(-5, -9)$ .

$$x = -5$$

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