Warm-Up *Put signed syllabus sheet in tray

Write each function in slope-intercept form.

1) 4x + y = 8 2) -y = 3x 3) 2y =10 - 6x

Determine whether each line is vertical or horizontal.

4.) x = 3/4 5.) y = 0

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Homework questions?

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Graph and Write linear functions

a linear function (equation) is an equation that represented by a line and it has a = sign.

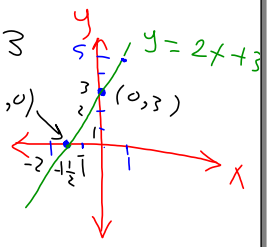
$y = 2x + 3$

$0 = 2x + 3$ $(-1\frac{1}{2}, 0)$

$-3 = 2x$

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

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



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First: What are the 3 forms of linear equations??

Slope-Intersept form

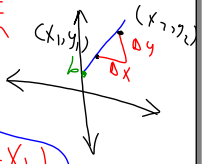
$y = mx + b$

slope Intersept

$m = \frac{\Delta y}{\Delta x} = \frac{\text{Raise}}{\text{Run}}$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

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



Use this formula to write an equation in slope-intersept form by knowing slope of the line m and one point.

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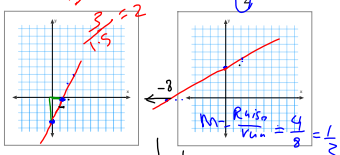
A. Graphing linear functions $y = mx + b$

1) $y = \frac{3}{5}x - 3$ 2) $y = \frac{1}{2}x + 4$



①Put x = 0

②Put y = 0

$y = 2x - 3$

$y = 2(0) - 3$

$y = -3$ $(0, -3)$

$0 = 2x - 3$

$3 = 2x$

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

$(1\frac{1}{2}, 0)$

when x = 0

$y = \frac{1}{2}(0) + 4$

$y = 4$ $(0, 4)$

when y = 0

$0 = \frac{1}{2}x + 4$

$-4 = \frac{1}{2}x$

$(2)\ (2)$

$-8 = x$

$(-8, 0)$

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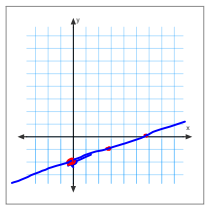
3) x - 3y = 6



$y = mx + b$

$x - 3y = 6$

$-x \quad -x$

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

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

when x = 0

$y = -2$

$(0, -2)$

other point

$y = 0$

$0 = \frac{1}{3}x - 2$

$(3)\ 2 = \frac{1}{3}x\ (3)$

$6 = x$ $(6, 0)$

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B. Writing equations for linear functions

Step 1: Find slope $m = \frac{y_2 - y_1}{x_2 - x_1}$

Step 2: Use point-slope equation $y - y_1 = m(x - x_1)$

Step 3: Solve for y to make equation in slope-intercept form

$y = mx + b$

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1)

Write the equation for a line with slope of 2/3 and passes through the point (-6, 5)

m

(x_1, y_1)

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

$y - 5 = \frac{2}{3}(x - (-6))$

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

$+5 \quad +5$

$y = \frac{2}{3}x + 9$

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2)

Write the equation for a line that passes through the points (3, -1) and (2, -3)

x_1, y_1 x_2, y_2

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{-3+1}{2-3}$

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

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

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

$y + 1 = 2x - 6$

$y = 2x - 7$

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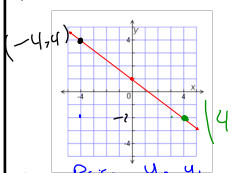
3) Write the equation of the graphed line in slope-intercept form.



$(-4, 4)$ $(4, -2)$

$m = \frac{\text{Rise}}{\text{Run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2-4}{4-(-4)}$

$m = \frac{-6}{8} = -\frac{3}{4}$

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

$y - 4 = -\frac{3}{4}(x - (-4))$

$y - 4 = -\frac{3}{4}x - 3$

$y = -\frac{3}{4}x + 1$

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Vocabulary - what do you remember??

Parallel Lines:	**Perpendicular Lines**:

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Slopes of Parallel/Perpendicular Lines

Parallel: Perpendicular:

Example) If y = 2x + 5, then what would be the slope of a parallel line and perpendicular line?

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4) **Write the equation of the line in slope-intercept form.**

parallel to y = 1.8x + 3 and through (5, 2)

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5)

Write the equation of the line in slope-intercept form.

perpendicular $y = -\frac{3}{2}x - 1$ to and through (9, –2)

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6)

Write the equation of the line in slope-intercept form.

parallel to 5x - y = 3 and through (1, 4)

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7) Write the equation of the line in slope-intercept form.

perpendicular to y - 3x + 2 = 0 and through (-1, 4)

*** Get equation in y = mx + b form first so you can determine current slope!*

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Determine if each pair of lines are parallel, perpendicular, or neither.

1. y = 1/4x + 9
   y = 4x - 9

2. y = 5 - 1/8x
   y = 8x + 2

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Determine if each pair of lines are parallel, perpendicular, or neither.

3. -3x + 4y = 15
   9x - 12y = 24

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