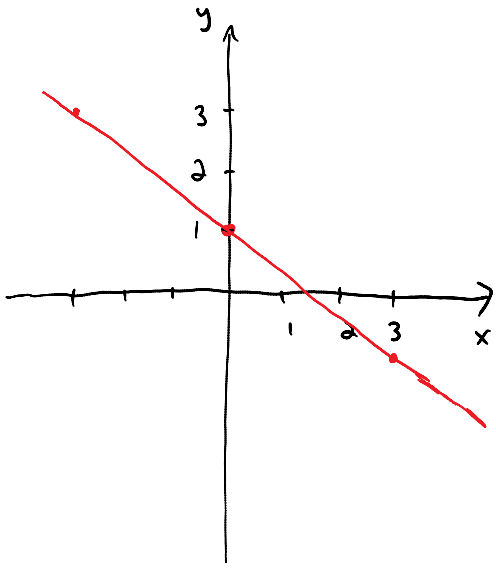
Section 3.3 cont'd

Thursday, October 17, 2013
9:34 AM

sketch the graph of $y = -\frac{2}{3}x + 1$

$-\frac{2}{3}$: slope

$+1$: y-int



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standard form: $Ax + By = C$

example: rewrite the equation $y = \frac{3}{7}x - 5$ into standard form with integral coefficients

coeffs that are integers

$7y = \left(\frac{3}{7}x - 5\right) \cdot 7$

$7y = 3x - 35$

$35 = 3x - 7y$

$3x - 7y = 35$

I will also accept $-3x + 7y = -35$

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point-slope form: $y - y_1 = m(x - x_1)$

example: write the equation of a line with slope -2 which runs through the point $(1, -7)$. Write your answer in standard form.

note: if I don't tell you which form to use, then use either standard or slope-intercept

method #1:

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

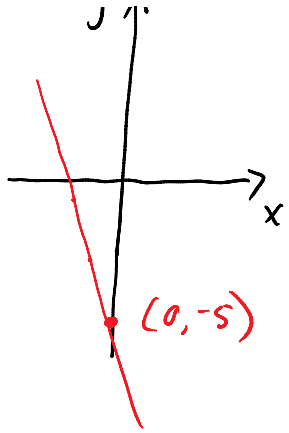
$$y + 7 = -2(x - 1)$$

$$y + 7 = -2x + 2$$

$$2x + y = -5$$

slope-intercept

$y = -2x - 5$



method #2:

$y = mx + b$

slope: -2
point: $(1,-7)$

$-7 = -2(1) + b$
$-7 = -2 + b$
$b = -5$

$y = mx + b$
$y = -2x - 5$

$\boxed{2x + y = -5}$

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example: Find the equation of a line that runs through the points $(6,0)$ and $(9,1)$. Give your answer in slope-intercept form.

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

$= \frac{1-0}{9-6} = \frac{1}{3}$

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

$$y - 0 = \frac{1}{3}(x - 6)$$

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

example: Give the equation of the line that runs through the point $(-8, -2)$ and is perpendicular to the line $3x - 5y = -7$. Give your answer in standard form.

$$3x - 5y = -7$$
$$-5y = -3x - 7$$
$$y = \frac{3}{5}x + \frac{7}{5}$$

$m_1 = \frac{3}{5}$

$m_2 = -\frac{5}{3}$ point $(-8, -2)$

$$y = mx + b$$
$$-2 = -\frac{5}{3}(-8) + b$$
$$-2 = +\frac{40}{3} + b$$
$$b = -2 - \frac{40}{3} = -\frac{46}{3}$$

$$y = mx + b$$

$$3(y) = \left(-\frac{5}{3}x - \frac{46}{3}\right)3$$

$$3y = -5x - 46$$

$$\boxed{5x + 3y = -46}$$

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

$$y + 2 = -\frac{5}{3}(x + 8)$$

$$3(y + 2) = -5(x + 8)$$

$$3y + 6 = -5x - 40$$

$$5x + 3y = -46$$