Warm-Up:

1) Find the slope of the line containing the points (7, 3) and (-3, 7).

$m = \frac{7-3}{-3-7} = \frac{4}{-10} = -\frac{2}{5}$

2) Graph the line perpendicular to y = -3x + 2 and through the point (2, 4).

y-int: $y = -3(0) + 2$

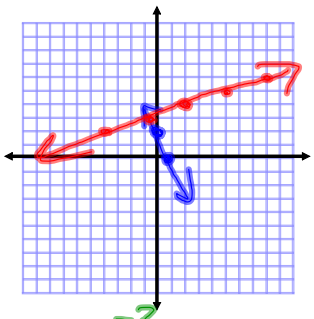
$y = 2$ (0, 2)

x-int: $0 = -3x + 2$

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

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

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



$m = \frac{-2}{2/3}$

$m = -2 \div \frac{2}{3}$

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

$m = -3$

26, 34, 36

26) (1999, 67) (2003, 58)

$m = \frac{58-67}{2003-1999} = \frac{-9}{4} = -2.25$ million

Film camera sales decreased.

34) thru (2, -1) ⊥ to $2x + 3y = 6$

y-int: $2(0) + 3y = 6$

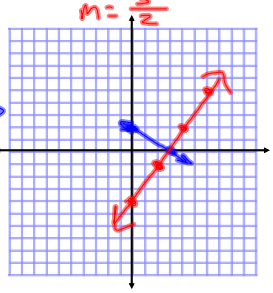
$y = 2$ (0, 2)

x-int: $2x + 3(0) = 6$

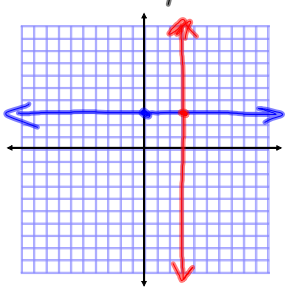
$x = 3$ (3, 0)

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

$m = \frac{3}{2}$



36) thru (3, 3) ⊥ to $y = 3$



Section 2-4: Writing Linear Equations

$y = mx + b$ where m is the slope and b is the y-intercept is written in slope-intercept form.

This can be used to write a linear equation.

The point-slope form can be used as well:

$y - y_1 = m(x - x_1)$ where (x_1, y_1) is a point on the line with slope m.

Examples:

1) Write an equation in slope intercept form for the line that has a slope of -3/5 and passes through (5, -2).

Point-Slope:

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

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

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

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

Slope-Intercept:

$y = mx + b$

$-2 = \frac{-3}{5}(5) + b$

$-2 = -3 + b$

$+3 \quad +3$

$1 = b$

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

Examples:

2) What is the equation of the line through (2, -3) and (-3, 7)?

A) $y = -2x - 1$

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

C) $y = \frac{1}{2}x + 1$

D) $y = -2x + 1$

$m = \frac{7-(-3)}{-3-2} = \frac{10}{-5} = -2$

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

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

$y + 3 = -2x + 4$

$-3 \quad\quad -3$

$y = -2x + 1$

Examples:

3) Lucy is paid a daily salary plus commission. When her sales are $100, she makes $58 total. When her sales are $300, she makes $78 total.

a) Write a linear equation to model this situation.

(100, 58) (300, 78)

$m = \frac{78-58}{300-100} = \frac{20}{200} = \frac{1}{10}$

$y - 58 = \frac{1}{10}(x - 100)$

$y - 58 = \frac{1}{10}x - 10$

$y = \frac{1}{10}x + 48$

b) What are Lucy's daily salary and commission rate?

Salary: $48 Commission: 10%

c) How much would Lucy make in one day if her sales were $500.

$y = \frac{1}{10}(500) + 48$

$y = 50 + 48$

$y = \$98$

Examples:

4) Write an equation that passes through (3, -2) and is perpendicular to the line whose equation is y = -5x + 1.

$m = -5$

$m = \frac{1}{5}$ (3, -2)

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

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

-2

$y = \frac{1}{5}x - \frac{3}{5} - \frac{10}{5}$

$y = \frac{1}{5}x - \frac{13}{5}$

Homework: Practice 2-4

Section 2-4 Vocab