

§1.6 & 1.7 homework assignments are posted.

If there's unnecessary repetition, you don't have to DO all of them. Just be confident you CAN, if put to it.

Quiz 2's returned tomorrow.

§1.5 Linear Regression - Good stuff, but requires Graphing Calculator or Spreadsheet.

§ 1.4 Everything About Lines.

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

$$y = mx + b \quad \text{Slope-Intercept}$$

$$y - y_1 = m(x - x_1) \quad \text{Book } \left. \begin{array}{l} \text{Point-Slope} \\ \text{misses} \end{array} \right\}$$

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

$$Ax + By = C \quad \text{STANDARD (OR GENERAL)}$$

A, B, C all integers.

(May need to multiply by LCD)

Parallel Lines

$$m_1 = m_2$$

Perpendicular Lines

$$m_2 = -\frac{1}{m_1}$$

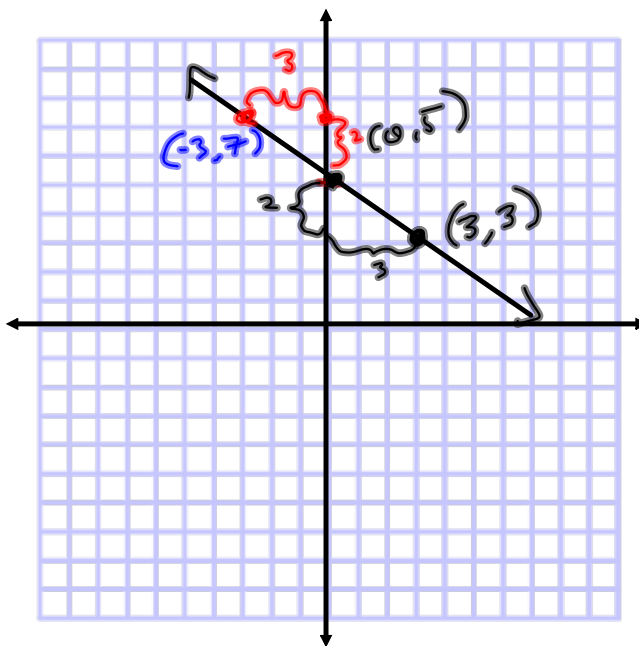
How I see it

$$\text{Book Says } m_1 m_2 = -1$$

$$y = mx + b$$

↑
Slope
↑
y-int is (0,b)

Graph $y = -\frac{2}{3}x + 5$ using slope & y-int.



$$m = -\frac{2}{3} = \frac{\text{Down } 2}{\text{Right } 3}$$

Negative Slope,

$$= \frac{2}{-3} = \frac{\text{Up } 2}{\text{Left } 3}$$

Find an equation of the line thru

$$(x_1, y_1) = (2, -3) \quad \& \quad (5, 7) = (x_2, y_2)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - (-3)}{5 - 2} = \frac{10}{3}$$

Point-Slope

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

$$y = \frac{10}{3}(x - 2) - 3 \quad \text{STOP!}$$

$$= \frac{10}{3}x - \frac{20}{3} - 3$$

$$= \frac{10}{3}x - \frac{20}{3} - \frac{3 \cdot 3}{3}$$

$$y = \frac{10}{3}x - \frac{29}{3}$$

Slope-Intercept

$$y = mx + b \quad \text{using } (2, -3)$$

$$-3 = \frac{10}{3}(2) + b$$

$$\frac{-3(3)}{3} = \frac{20}{3} + \frac{3b}{3}$$

$$-9 = 20 + 3b$$

$$-29 = 3b$$

$$-\frac{29}{3} = b$$

$$y = \frac{10}{3}x - \frac{29}{3}$$

Same ✓

Write in standard form $Ax + By = C$

$$-\frac{10}{3}x + y = -\frac{29}{3}$$

... with integer coefficients (Clear Fractions)

$$-10x + 3y = -29$$

Find an equation of the line
thru $(-13, 17.217)$ with slope 3π

$$y = 3\pi(x + 13) + 17.217$$

Find a line parallel to this through

$$(500, -627) \quad \boxed{y = m(x - x_1) + y_1}$$

$$y = 3\pi(x - 500) - 627$$

Find a line perpendicular to this, through

$$(500, -627)$$

$$y = -\frac{1}{3\pi}(x - 500) - 627$$

|| to $y = 5x - 2$ thru $(7, 1)$

$$y = 5(x - 7) + 1$$

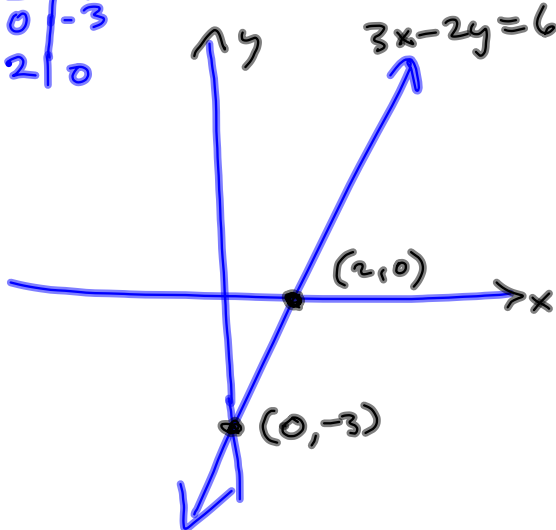
\perp to $y = 5x - 2$ thru $(7, 1)$

$$y = -\frac{1}{5}(x - 7) + 1$$

If I ask for the graph of a line,
what am I generally looking for?

$$3x - 2y = 6$$

x	y
0	-3
2	0



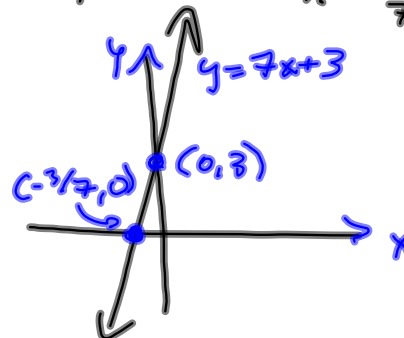
$$y = 7x + 3$$

x	y
0	3
$-\frac{3}{7}$	0

$$y = 7x + 3 \stackrel{\text{SET}}{=} 0$$

$$7x = -3$$

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



Sl.6 Quadratic Equations

$$ax^2 + bx + c = 0$$

3 ways to solve:

- ① Complete the square ✓
- ② Factor
- ③ Use Quadratic Formula.

$y = x^2 - 2$ is
quadratic function
 $f(x) = x^2 - 2$

Already Touched on it
(Circles)
See Quiz 3, coming
soon!

① Square Root Principle:

$$x^2 = A$$

$$\Rightarrow x = \pm \sqrt{A}$$

$$x^2 = 16$$

$$\sqrt{x^2} = \sqrt{16}$$

$$|x| = \sqrt{16} = 4$$

$$x = 4 \text{ OR } x = -4$$

$$x = \pm 4$$

$$x = 3 \quad \sqrt{x^2} = \sqrt{3^2} = 3$$

$$x = -3 \quad \sqrt{x^2} = \sqrt{(-3)^2} = \sqrt{9} = 3$$

$$(x+5)^2 = 7$$

$$\sqrt{(x+5)^2} = \sqrt{7}$$

$$|x+5| = \sqrt{7}$$

$$x+5 = \pm \sqrt{7}$$

$$x = -5 \pm \sqrt{7}$$

A legit
one-step move.

$$x^2 + 10x + 3 = 0$$

$$x^2 + 10x + 5^2 = -3 + 25$$

$$\downarrow \frac{10}{2} = 5 \rightsquigarrow 5^2$$

$$(x + 5)^2 = 22$$

$$x + 5 = \pm \sqrt{22}$$

$$x = -5 \pm \sqrt{22}$$

Solve by
completing the
square