BE - Alg. 2 TUESDAY 9-8-09

① SOLVE $8(x-1) < 4(2x+5)$

② WHAT QUADRANTS does the line $-3x - 2y = 15$ PASS through?

ACT KMJ JUNE 09 ↓

③ A function $f(x)$ is defined as $f(x) = -8x^2$. What is $f(-3)$.

④ $-3|-6+8| = ?$

- Review/RETURN graded * HW3 and Quiz 3
- EXAM 1 THURSDAY

* MUST TAKE HW UP A COUPLE OF NOTENES:
  - COMPLETE
  - NEAT
  - ACCURATE
  - ORGANIZED

BC
Answers

① $8(x-1) < 4(2x+5)$

$8x - 8 < 8x + 20$

$-8x \qquad -8x$

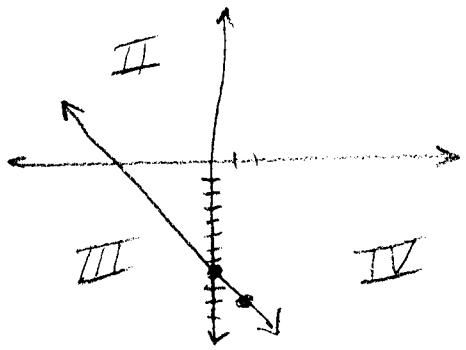
$-8 < 20$ FALSE $\Rightarrow$ **NO SOLUTION**

② $-3x - 2y = 15$

$+3x \qquad +3x$

$\frac{-2y}{-2} = \frac{3x + 15}{-2}$

$y = -\frac{3}{2}x - \frac{15}{2}$ $\left(-\frac{15}{2} = -7\frac{1}{2}\right)$



II, III, IV

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③ $f(x) = -8x^2$

$f(\ ) = -8(\ )^2$

$f(-3) = -8(-3)^2$

$= -8(9) = \boxed{-72}$

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④ $-3|-6+8|$

$-3|2| = -3(2) = \boxed{-6}$

Ch 2-2 → 2-4 Linear Equations

How do you know you are dealing with a LE? ⇒ Only x', y', Numbers +, −

Linear (Ex) • $2x + 3y - x + \frac{1}{2}y = 3 - 9x$

Not Linear (Ex) • $4xy = 6$
• $2x^2 = y$
• $\frac{4}{x} = y$

Can combine x', y', number terms in thousands of ways ⇒ 2 most common forms:

Standard Form } $\boxed{Ax + By = C}$ or $\boxed{Ax + By + C = 0}$

$\boxed{A \text{ is } \geq 0,\ A, B, C \text{ are integers}}$

(Ex) $2x + 3y = 9$ or $2x + 3y - 9 = 0$

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

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

$15\left(\frac{1}{5}x - 2y\right) = \left(-\frac{1}{3}\right)15$

$\boxed{3x - 30y = -5}$

Most useful form ⇒ "function" form ⇒ Y by itself

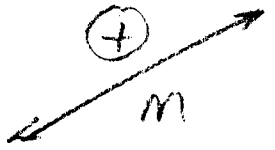
SLOPE-Intercept Form $\Big\}$ $y = f(x) = mx + b$

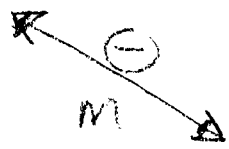
m = slope, $(0, b)$ ⇒ y intercept

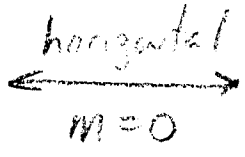
(Ex) $y = 2x - 6$

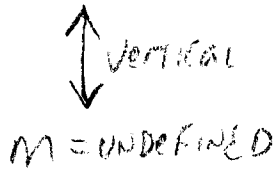
How to graph $\Big\}$ ① begin at $b = (0, -6)$

② move by slope $= \frac{\text{Rise}}{\text{Run}} = \frac{2}{1}$

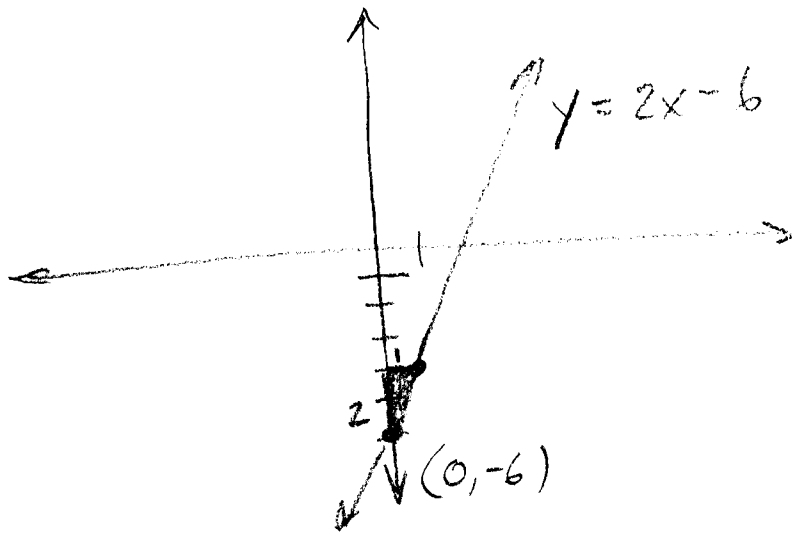








(Ex) $y = \frac{1}{5}x - 3$ $\quad y = -\frac{2}{3}x - 6$ $\quad y = 4$ $\quad x = 3$



$$m = \frac{\text{RISE}}{\text{RUN}} = \frac{\text{CHANGE IN } Y \updownarrow}{\text{CHANGE IN } X \leftrightarrow} = \frac{Y_2 - Y_1}{X_2 - X_1}$$

For any 2 points (X_1, Y_1), (X_2, Y_2)

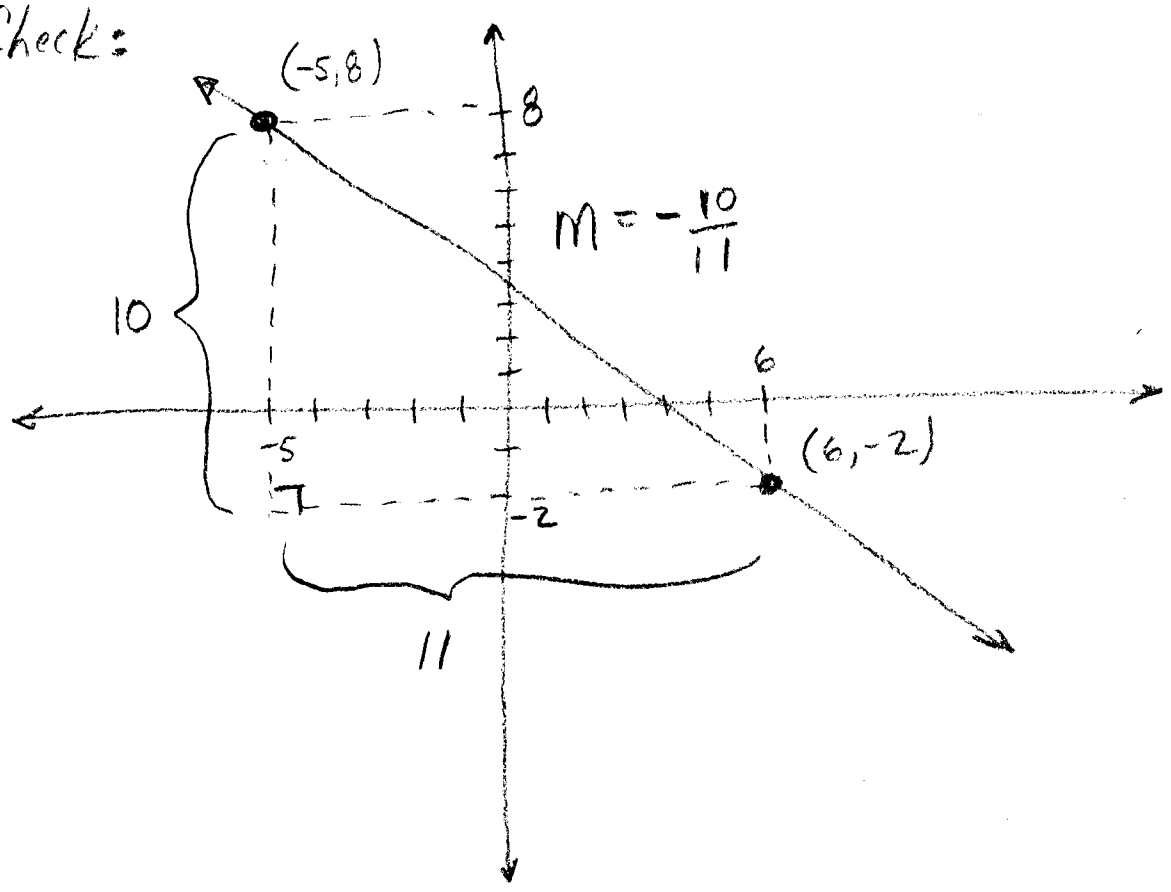
FIND SLOPE through $(6, -2), (-5, 8)$

$(X_1, Y_1), (X_2, Y_2)$

$(6, -2), (-5, 8)$

$$\frac{8 - (-2)}{-5 - 6} = \frac{8 + 2}{-11} = \frac{10}{-11} = \boxed{\frac{-10}{11} = m}$$

Lets Check:



ONE of the most typical problems in Algebra → FIND EQUATION of LINE (EOL) if you know 2 points on line.

Ex 2 pg 77 FIND EOL through $(-1, 4), (-4, 5)$

FIND $m \Rightarrow (-1, 4), (-4, 5) \Rightarrow \frac{5-4}{-4+1} = \frac{1}{-3} = -\frac{1}{3} = m$

$y = mx + b$

Use KNOWN (x, y), m to find b
Use either $(-1, 4)$ or $(-4, 5)$
⇒ Use ANY (x, y) on LINE!

$4 = \left(-\frac{1}{3}\right)(-1) + b$

$4 = \frac{1}{3} + b$

$-\frac{1}{3} \quad -\frac{1}{3}$

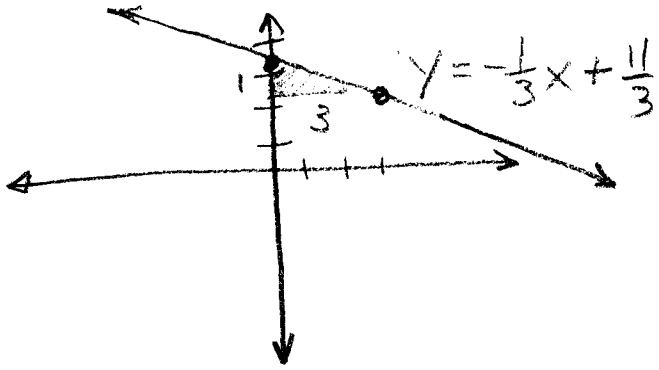
$3\frac{2}{3} = \frac{11}{3} = b$

$y = mx + b$

$\boxed{y = -\frac{1}{3}x + \frac{11}{3}}$

"$y = mx + b$ twice METHOD"

Graph:



Finally: Parallel Lines have same slope

(Ex) $y = 2x - 6$
$y = 2x + 4$
$y = 2x$
} $m_{\parallel} = 2$ or $\frac{2}{1}$

Perpendicular have slopes opposite in sign and are reciprocals.

(Ex) $y = 2x - 6$
$y = -\frac{1}{2}x + 4$
} $m = 2$, $m_{\perp} = -\frac{1}{2}$

(Ex) $y = -5x$
$y = \frac{1}{5}x + 1$
} $m = -5$, $m_{\perp} = \frac{1}{5}$

(Ex) Find EOL Perpendicular to $y = 2x + 6$ through $(4, 3)$

$m_{\perp} = -\frac{1}{2}$ $(4, 3)$ x, y Use $y = mx + b$ twice

$3 = -\frac{1}{2} \cdot 4 + b$

$3 = -2 + b$ $\therefore$ $b = 5$

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

Perpendicular to $y = 2x + 6$ and goes through $(4, 3)$

Homework: Pg. 78 #4-10, 19-21
Pg. 79