MENTAL MATH

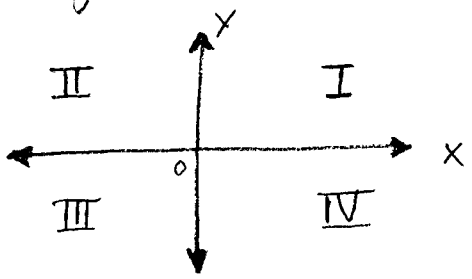
① $\frac{2}{15} \cdot \frac{3}{8}$

② $\frac{3}{4} \div \frac{2}{3}$

BE-PRECALC MONDAY 8-31-09

ACT KMJ JUNE 09

① WHAT ARE THE QUADRANTS of the STANDARD (X,Y) COORDINATE PLANE BELOW that CONTAIN POINTS ON the GRAPH OF THE EQUATION $4x - 2y = 8$?



QUADRANTS OF THE STANDARD (X,Y) COORDINATE PLANE

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② THE GRAPH OF $y = -5x^2 + 9$ PASSES through $(1, 2a)$ IN the STANDARD (X,Y) COORDINATE PLANE. WHAT IS THE VALUE OF a?

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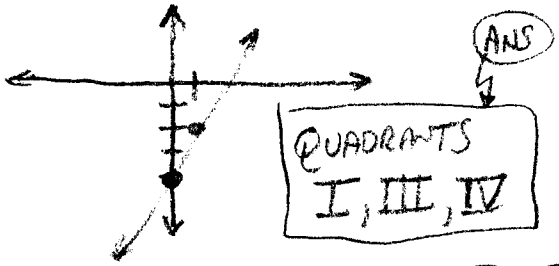
① $4x - 2y = 8$

$-4x \quad -4x$

$\frac{-2y}{-2} = \frac{-4x + 8}{-2}$

$\boxed{Y = 2x - 4}$



ANS

QUADRANTS I, III, IV

$y = f(x) = -5x^2 + 9$

$f(1) = -5(1)^2 + 9$

$f(1) = -5 + 9 = 4$

$y = 2a = 4$

$\therefore \boxed{a = 2}$

*RETURN QUIZ 2 ; HW 2

Ch. 1-5 Writing Equations of Parallel (∥) and Perpendicular (⊥) Lines

PARALLEL LINES HAVE THE <u>SAME</u> SLOPE

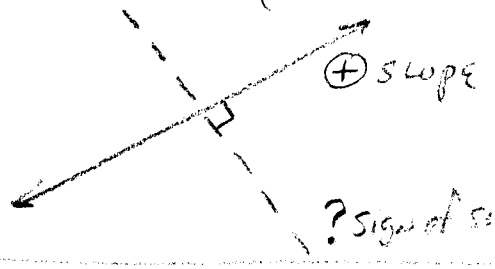
Ex) ∥ LINES: $y = 3x - 2$

$y = 3x + 6$

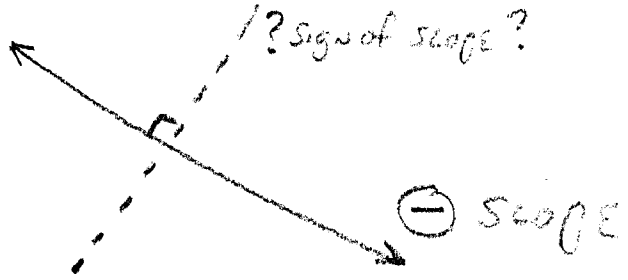
$y = 3x$

PERPENDICULAR LINES HAVE SLOPE THAT ARE Reciprocals (flipped upside down) AND ARE <u>OPPOSITE</u> IN SIGN. Why different signs?

What slope ⊕ or ⊖ MUST you have to cross A positive sloped line at 90°?



What slope ⊕ or ⊖ MUST you have to cross A negative slope line at 90°?



Typical problem: (Similar to Ex 3 Pg 34)

Write the standard form of the EOL's through $(4,-7)$ and $\parallel$ to and $\perp$ to $2x-5y+8=0$

Find m of $2x-5y+8=0$

$-8 \quad -8$

$2x-5y = -8$

$-2x \quad\quad -2x$

$\frac{-5y}{-5} = \frac{-2x-8}{-5}$

$y = \frac{2}{5}x + \frac{8}{5}$

Solve for y to get $y = mx + b$

$m = \frac{2}{5}$

$m_{\parallel} = \frac{2}{5}$

$m_{\perp} = -\frac{5}{2}$

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x, y

EOL $\parallel \Rightarrow (4,-7)$ $m_{\parallel} = \frac{2}{5}$

$y = mx + b$

$-7 = \frac{2}{5} \cdot 4 + b$

$-\frac{8}{5} + \left(-\frac{35}{5}\right) = b \quad \therefore \boxed{b = -\frac{43}{5}}$ $\quad y = \frac{2}{5}x - \frac{43}{5}$

$5y = 2x - 43$

$\boxed{2x - 5y = 43}$

EOL $\perp \Rightarrow (4,-7)$ $m_{\perp} = -\frac{5}{2}$

$-7 = -\frac{5}{2} \cdot 4 + b$

$-7 = -10 + b \quad \therefore \boxed{b = 3}$ $\quad y = -\frac{5}{2}x + 3$

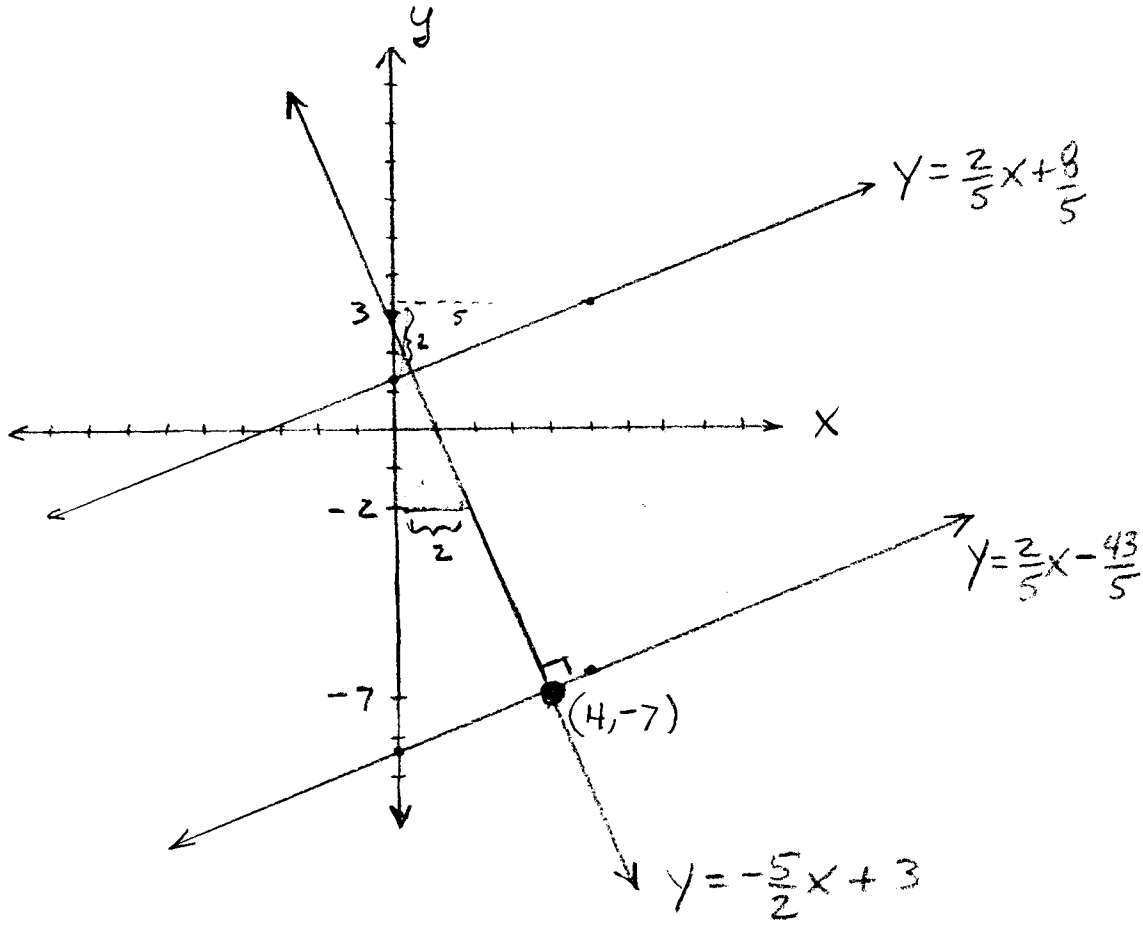
$2y = -5x + 3$

$\boxed{5x + 2y = 3}$

Check with graph: ORIGINAL LINE $y = \frac{2}{5}x + \frac{8}{5}$ $\frac{8}{5} = 1\frac{3}{5}$

// Through (4,-7) $y = \frac{2}{5}x - \frac{43}{5}$ $-\frac{43}{5} = -8\frac{3}{5}$

⊥ Through (4,-7) $y = -\frac{5}{2}x + 3$



Don't forget: Standard Form $\Rightarrow Ax + By = C$

$A \geq 0$

A, B, C are integers

Ex 5 Pg 35 Find EOL for Perpendicular Bisector

↑ cuts line segment in half

of line segment with endpoints S(3,4), T(11,18)

Find m through (3,4), (11,18) so you know $m_\perp$

$$\frac{18-4}{11-3} = \frac{14}{8} = \frac{7}{4} = m \quad \therefore \boxed{m_\perp = -\frac{4}{7}}$$

Need midpoint ⇒ recall midpoint = $(\bar{x}, \bar{y})$

↑ Avg. x, ↑ Avg. y

↓

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$$\text{midpoint} = \left(\frac{11+3}{2}, \frac{18+4}{2}\right) = (7,11)$$

x, y

$y = mx + b \quad \therefore \quad 11 = -\frac{4}{7} \cdot 7 + b$

$11 = -4 + b \quad \therefore \boxed{b = 15}$

$\boxed{y = -\frac{4}{7}x + 15}$ S-I Form

STANDARD FORM $7y = -4x + 105$

$\boxed{4x + 7y = 105}$

HOMEWORK: Pg. 36 # 22, 23, 25, 26, 28, 30