BE-PRECALCULUS | MONDAY 8-24-09

MENTAL MATH WARMUPS:

① $8\left(\frac{2}{3}\right)$ ② $\frac{1}{2}(6)$ ③ $\frac{9}{\frac{1}{3}}$

④ $\frac{-\frac{2}{5}}{\frac{1}{2}}$ ⑤ $\frac{2}{5}(12)$ ⑥ $-\frac{3}{4}\left(-\frac{2}{3}\right)$

ACT – "THE REAL ACT" ⇒ 3 PRACTICE TESTS by
1 MIN. EACH 2ND EDITION "THE MAKERS OF THE ACT"

⑦ If $f(x) = x^2 - 2$ then $f(x+h) = ?$

⑧ KAYA RAN $1\frac{2}{5}$ miles ON MONDAY AND $2\frac{1}{3}$ MILES ON TUESDAY. WHAT WAS THE TOTAL DISTANCE, IN MILES, KAYA RAN DURING THESE 2 DAYS?

⑨ If $4x + 3 = 9x - 4$ then $x = ?$

GE
ANSWERS
(ACT)

⑦ $f(x) = x^2 - 2$

$f(x+h) = (x+h)^2 - 2$

$= (x+h)(x+h) - 2$

$= x^2 + hx + hx + h^2 - 2$

$= \boxed{x^2 + 2hx + h^2 - 2}$

or $2 \times h$

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⑧ $1\frac{2}{5} + 2\frac{1}{3} \Rightarrow \frac{2}{5} + \frac{1}{3}$

$\frac{6}{15} + \frac{5}{15} = \frac{11}{15}$

$= \boxed{3\frac{11}{15} \text{ miles}}$

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⑨ $4x + 3 = 9x - 4$

$-4x + 4 \quad -4x + 4$

$\frac{7}{5} = \frac{5x}{5}$

$\boxed{\frac{7}{5} = x}$

PRECALCULUS 1

- The importance of doing a good job on homework

	HW 1	Quiz 1*
Lowest 6 HW	0%	25%
	0%	33%
	30%	43%
	41%	75%
	50%	67%
	59%	75%
Highest 6 HW	111%	100%
	107%	92%
	96%	100%
	95%	92%
	95%	100%
	94%	75%

*4-answer multiple choice ⇒ 0% ~ 25%

- Small, 12 question quiz over Ch 1-2
- The longer, harder topics widen this gap.
- No precalc student can claim Ch 1-2 is "out of reach"

A little review:

"like" terms ⇒ 1. same variable
2. variables have same exponent

"combine" like terms ⇒ + or −

Ex) $\underline{2x} + 3y \checkmark - z + 4 + \underline{5xy} + \underline{3x} - \underline{2xy} + 4x^2$

$5x + 3y - z + 4 + 3xy + 4x^2$

Degree 1 | Degree 1 | Degree 1 | Degree 0 | Degree 2 | Degree 2

The degree of a single term (monomial) is the sum of the exponents of all its variables

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$4x^2 + 3xy + 5x + 3y - z + 4$

Sign Rules: +, − SSA, KSS "same sign add, keep same sign"

Ex) $2 + 6 = 8$
$-2 - 6 = -8$

DSD, BOW "different signs take their difference, biggest one wins"

Ex) $-2 + 6 = 4$
$2 - 6 = -4$

SPECIAL "taking away a − is a +"

Ex) $-2 - (-6) = -2 \overset{+}{-} (-6) = 4$

F.R.
+, − CD
• ÷ $\frac{t \cdot t}{b \cdot b}$ Flip

•, ÷ SPDN "same signs +, diff. signs −"

Ex) $-2(-2) = 4$ $\quad \frac{-2}{-2} = 1$
$-2(2) = -4$

If you have an equation in 2 variables, say x and y, and the x terms and y terms are only to the first power (x', y') then you will have a linear equation.

The graph of the equation is a line.

You can always combine all the x' terms, y' terms, and numbers. The Standard Form of a LE is $Ax + By = C$

- Ax: ALL the x' terms combined
- By: All the y' terms combined
- C: ALL the numbers

CONVENTIONS $A > 0$

A, B, and C are NOT fractions

(Ex) $2x + 3y = 7$

(Ex) $\frac{1}{3}x + \frac{2}{5}y = 2 \Rightarrow 5x + 6y = 30 \Rightarrow$ SF

(Ex) $-5x + y = 6 \Rightarrow 5x - y = -6 \Rightarrow$ CAS

CHANGE ALL SIGNS

If instead of combining all terms, you solved to get y "by itself", you will get this form:

$$y = mx + b$$

m: SLOPE $\Rightarrow \frac{\text{rise}}{\text{run}} = m$

$(0, b)$ IS THE POINT ON THE LINE WHERE IT CROSSES THE y-AXIS, b is called the y-INTERCEPT

SLOPE-INTERCEPT FORM (OF A LINEAR EQUATION)

$y = f(x) = mx + b$ ← function form

(ex) $y = 3x - 2$

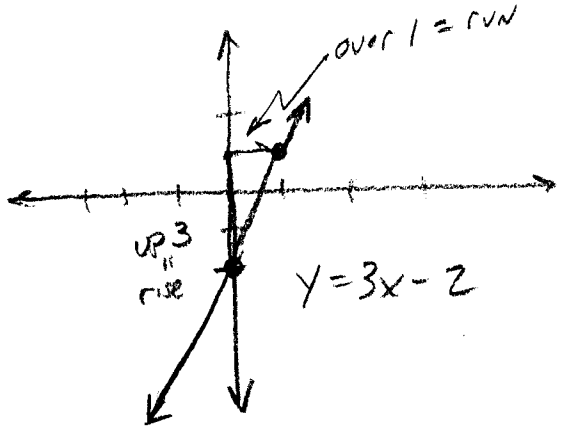
$m = +\frac{3}{1}$

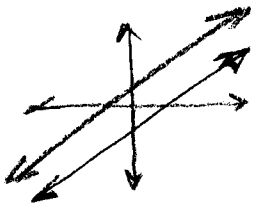
$(0, -2)$ crosses y-AXIS

Graph TIP

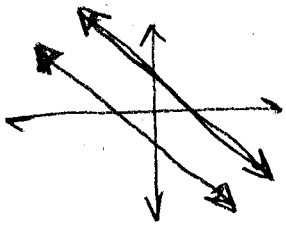
Begin at b

Move by slope

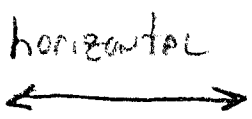




+m
POSITIVE SLOPES



−m
NEGATIVE SLOPES



HORIZONTAL

$m = 0$

$\frac{\text{RISE}}{\text{RUN}} = \frac{0}{\text{RUN}}$

VERTICAL

m = UNDEFINED

$\frac{\text{RISE}}{\text{RUN}} = \frac{\text{RISE}}{0}$

↗ UNDEFINED

X-INTERCEPT $\Rightarrow (x, 0)$

Y-INTERCEPT $\Rightarrow (0, y)$

EX 1 PG 20 GRAPH $3x - y - 2 = 0$ USING MOI

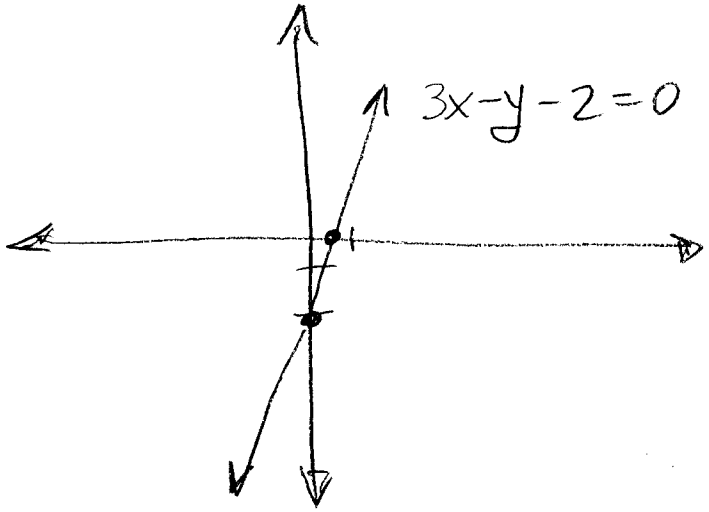
MOI = METHOD OF INTERCEPTS

$y_{INT} \Rightarrow x = 0 \therefore 3(0) - y = 2$

$y = -2 \Rightarrow (0, -2)$

$x_{INT} \Rightarrow y = 0 \therefore 3x - 0 = 2$

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



LOOK AT SI FORM

$3x - y = 2$

$-y = -3x + 2$

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

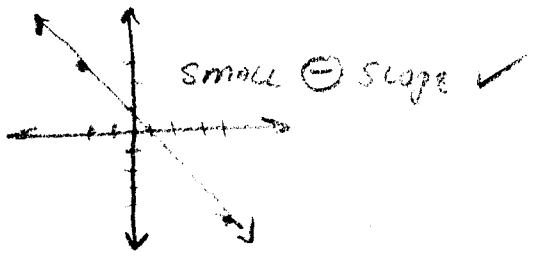
If you know the coordinates of any 2 points on the line,

$$m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

(EX) Find m through $(4, -6), (-2, 3)$

$(4, -6), (-2, 3)$ (⊖ above, ⊖ below)

$$m = \frac{3 - (-6)}{-2 - 4} = \frac{-3}{-6} = \frac{1}{2}$$

CK 

The x-intercepts ⇒ $y = 0$ are also called the <u>zeros</u> of the function.

If $y = f(x) = mx + b$

If $0 = mx + b$

$$\frac{-b}{m} = \frac{mx}{m}$$

$\therefore x = \frac{-b}{m}$ = zero of the function

x-intercept

$\left(-\frac{b}{m}, 0\right)$

Homework: Read Ch 1-3 Graphing Linear Equations + Pg. 23 & 24 #11-17, 24-26