(D) * undo using order of op.'s backwards (SADMEG)

* $\frac{A}{B} = \frac{C}{D}$ cross-multiply

$AD = CB$

* sometimes the variable disappears

$3(x-2) = 3x+4$

$3x - 6 = 3x + 4$

$-3x \quad -3x$

$-6 = 4$

False

(No Solution)

$3(x-2) = 3x-6$

$3x - 6 = 3x - 6$

$-6 = -6$

TRUE

infinite solutions

$\mathbb{R}$

#36 $\frac{x+5}{3} = \frac{8}{x-5}$

$(x+5)(x-5) = 24$

$x^2 - 25 = 24$

$+25 \quad +25$

$x^2 = 49$

$x = 7$ and -7

Sep 11-8:42 AM

* ex. $(x-2)(x+1) = 0$

$x - 2 = 0 \qquad x + 1 = 0$

$x = 2$ & $x = -1$

Sep 11-9:10 AM

(E) If you mult/divide by a negative #... you must flip direction of the sign

ex. Solve for y:

$8 - 2y > 7x$

$-8 \quad -8$

$\frac{-2y}{-2} > \frac{7x}{-2} - \frac{8}{-2}$

$y < -\frac{7}{2}x + 4$

$<$ $>$ (not included) o

$\leq$ $\geq$ (included) •

ex. $x > 4$

#42

$2 + 3x \leq 4x + 3 \leq 3x + 5$

$2 + 3x \leq 4x + 3$

$-4x \quad -4x$

$2 - x \leq 3$

$-2 \quad -2$

$-x \leq 1$

$\frac{-x}{-1} \leq \frac{1}{-1}$

$x \geq -1$

$4x + 3 \leq 3x + 5$

$x + 3 \leq 5$

$x \leq 2$

Sep 11-9:13 AM

(F) Define "unknowns" first → use variable for the part you know the least about

Use what you do know to write & solve an equation

#49 3500 + 85% of sales = 20000

$3500 + .85x = 20000$

#51 24 pancakes, 1½ cups flour; only want 8 ?

$\frac{24}{1\frac{1}{2}} = \frac{8}{x} \rightarrow 24x = 8(1\frac{1}{2})$

$\frac{24x}{24} = \frac{12}{24}$

$x = \frac{1}{2}$ cups

Sep 11-9:21 AM

(G) multiplication

* multiply straight across

division

* keep flip reciprocal

ex. $8 \div \frac{5}{3}$

K F R

$\frac{8}{1} \cdot \frac{3}{5} = \frac{24}{5} = 4\frac{4}{5}$

~addition/subtraction need common denominator

ex. $\frac{2}{3} \cdot \frac{8}{8} + \frac{1}{8} \cdot \frac{3}{3}$

$\frac{16}{24} + \frac{3}{24} = \frac{19}{24}$

* $1\frac{2}{3} \rightarrow$ improper fract. $\frac{3 \cdot 1 + 2}{3} = \frac{5}{3}$

$\frac{3}{3}$ and $\frac{2}{3}$

$\frac{5}{3}$

* 23% = .23

.007% = .00007

Sep 11-9:28 AM

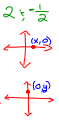
(H) Slope

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

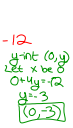
parallel: same slope ex. 2 ; 2

perpendicular: opposite reciprocal ex. 2 ; $-\frac{1}{2}$

~x-intercept crosses x-axis y=0 (x,0)



~y-intercept crosses y-axis



x is zero (0,y)

ex. $3x + 4y = -12$

x-int (x,0): $3x + 0 = -12$, $x = -4$, (-4,0)

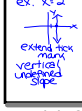
y-int (0,y): let x be 0, $0 + 4y = -12$, $y = -3$, (0,-3)

* Graphing $y = mx + b$

*1st plot (0,b)

*use rise/run (m) to plot 2 more points

* x = a #* ex. x = 2



extend rise/run vertical undefined slope

* y = a #* ex. y = 1

horiz. m = 0

Sep 11-9:34 AM

(I) Always look for GCF first

ex. $4x^3y^2 + 10x^2y$

$2x^2y(2xy + 5)$

$x^2 + bx + c$
multiply to c
add to b

ex. $x^2 - 3x - 10$
mult: -10
add: -3
$(x-5)(x+2)$
check by "FOIL"ing

ex. $x^2 - 4$
multiply to -4
add to 0
$(x-2)(x+2)$

ex. $x^2 + 25$
mult: 25
add: 0
not factorable for now

Sep 11-9:43 AM

(J) When in doubt, write it out

~ $x^3 \cdot x^2 = x \cdot x \cdot x \cdot x \cdot x = x^5$ add

~ $\frac{x^4}{x^3} = \frac{\cancel{x}\cdot\cancel{x}\cdot\cancel{x}\cdot x}{\cancel{x}\cdot\cancel{x}\cdot\cancel{x}} = x$ subtract

~ $(x^2)^3 = (x \cdot x)(x \cdot x)(x \cdot x) = x^6$ multiply

~ $x^0 = 1$

~ $(3xy^2)^3 = 27x^3y^6$

~ $x^{-1} = \frac{1}{x}$

ex. $\frac{m^3n^2p^4}{mp^2n^8} = m^2n^{-6}p^2 = \frac{m^2p^2}{n^6}$

$\frac{mmm\ nn\ pppp}{m\ nnnnnnnn\ pp} = \frac{m^2p^2}{n^6}$

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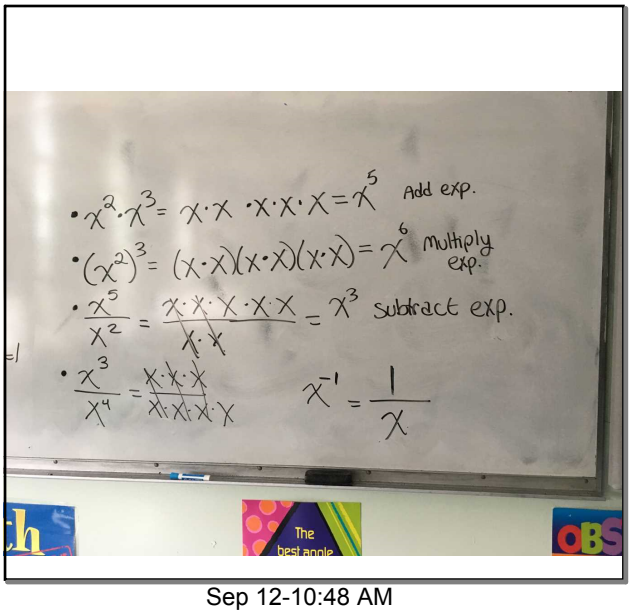

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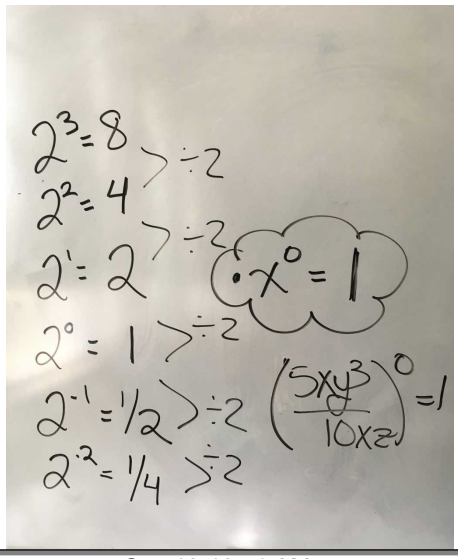

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