Isolating a Variable (Complex)

One of the most important skills you will encounter for the next two units is the ability to take an equation in standard form (Ax + By = C) and solve for y. You had a few problems from yesterday like this, but take some time to practice a few more.

a. $5x - 2y = 8$
$$\frac{-5x \qquad -5x}{\frac{-2y}{-2} = \frac{8-5x}{-2}}$$
$$y = \frac{8-5x}{-2}$$
$$y = -4 + 2.5x$$

b. $3x + 3y = 6$
$$\frac{+3x \quad | \quad +3x}{\frac{3y}{3} = \frac{6+3x}{3}}$$
$$y = \frac{6+3x}{3}$$
$$y = 2 + 1x$$

c. $-7x - 4y = 12$
$$\frac{+7x \quad | \quad +7x}{\frac{-4y}{-4} = \frac{12+7x}{-4}}$$
$$y = \frac{12+7x}{-4}$$
$$y = -3 - 1.75x$$

Solving Literal Equations with Distribution

When solving problems with distribution or common factors, you do NOT want to distribute the term on the outside. Instead divide both sides by the factor on the outside of the parenthesis.

Note: If you see you are trying to solve for a variable in multiple locations, move all the terms with that variable to one side and then factor that variable out.

a. Solve $a(y + 1) = b$ for y.
$$a(y+1) = b$$
$$ay + a = b$$
$$\frac{-a \quad | \quad -a}{\frac{ay}{a} = \frac{b-a}{a}}$$
$$y = \frac{b-1a}{1a} \quad OR \quad \frac{b}{a} - 1$$

b. $3ax - b = d - 4cx$ for x

c. $4x - 3m = 2mx - 5$ for x.

d. $4x + b = 2x + c$ for x.
$$4x + b = 2x + c$$
$$\frac{-2x \qquad -2x}{2x + b = c}$$
$$\frac{-b \quad | \quad -b}{\frac{2x}{2} = \frac{c-b}{2}}$$
$$x = \frac{c-b}{2}$$

Complex Literal Equations

a.) $\frac{5x+y}{a} = 2$ for a

$$\not{a} \cdot \frac{5x+y}{\not{a}} = 2 \cdot a$$

$$\frac{5x+y}{2} = \frac{\cancel{2}a}{\cancel{2}}$$

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

b.) $c = \frac{3}{4}y + b$, **for y**

$$\begin{array}{c|c} c & \frac{3}{4}y + b \\ -b & -b \end{array}$$

$$\frac{4}{3} \cdot c - b = \frac{\cancel{3}}{\cancel{4}}y \cdot \frac{\cancel{4}}{\cancel{3}}$$

$$\frac{4}{3}(c-b) = y \quad \text{or} \quad \frac{4}{3}c - \frac{4}{3}b = y$$

c. $P = \frac{1.2W}{H^2}$ for W

d. $p(t + 1) = -2$, for t

e. $\frac{3ax - n}{5} - 4$ for x

f. $\frac{34 - A}{2} = H$ for A