Unmasking the Villain

Solving Multi-Step equations

Remember Scooby Doo?

- Solving equations is a lot like unmasking the villains in Scooby Doo.
- Your main job is to find out who the villain (the variable) really is.

One-Step Equations

- Sometimes, the villain is just wearing one mask, and all you have to do is take it off.

- In terms of solving an equation we do that using inverse operations.

Warm-up Problems

$2x = 7$

$Z + \frac{1}{2} = 5$

$\frac{w}{3} = 8$

Two Step Equations

- http://www.imeem.com/mersyone/video/4BpFpuzL/family_guy_tv_show_actually_im_a_broom_jerry_springer_a/
- What costumes did the broom wear?
- In what order did the broom take off its costumes?

- Thinking about how we get dressed… which costume did the broom have to put on first?

Order of Operations

If $x = 2$ then

$2x = 4$ (multiply both sides by 2)

$2x + 3 = 7$ (add 3 to both sides)

What order do the operations go in for $2x+3 = 7$?

So to find x, we need to go backwards!

Solving equations

- Remember when solving equations, we want to get the variable by itself.
- When solving $2x+3=7$, what should we do first?
- Why?

$2x + 3 = 7$

- First, subtract 3 from both sides (undoing the addition)

$$2x = 4$$

- Now divide both sides by 2 (undoing the multiplication)

$$x = 2$$

- Check your answer!

$$2*2 + 3 = 4 + 3 = 7$$

¾(w-2)

- If we knew what number w was, what operation would we do first?
- What would we do next?

- To solve: ¾(w-2) = 6 we do the operations in reverse!

¾(w-2) = 6

- Multiply both sides by 4/3 (the reciprocal)

  w - 2 = 8

- Add 2 to both sides

  w = 10

- Check your answer!

  ¾(10-2) = ¾(8) = 6

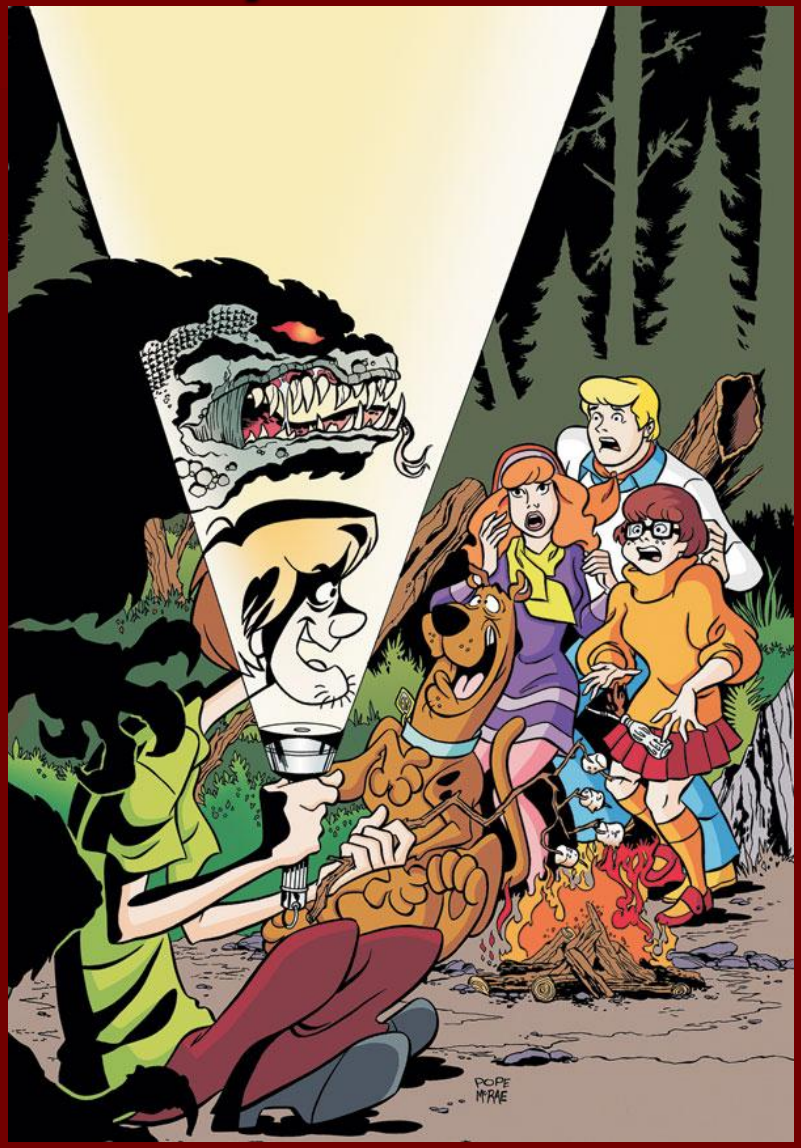
Problems to try:

$7a - 3 = 2$

$\frac{1}{4}x + 1 = 9$

$2.4w - \frac{1}{2} = 3.1$

$\frac{3}{4}(2x+1) = 9$



Final Comments

- You should always combine like terms before starting to solve an equation.
- Sometimes you may have to simplify first.
- There are multiple ways to solve an equation, and any of them are okay, as long as you use proper reasoning.

Examples:

$4x + 5 + x - 1 = 7$

$3(2x-1) - x = 4$