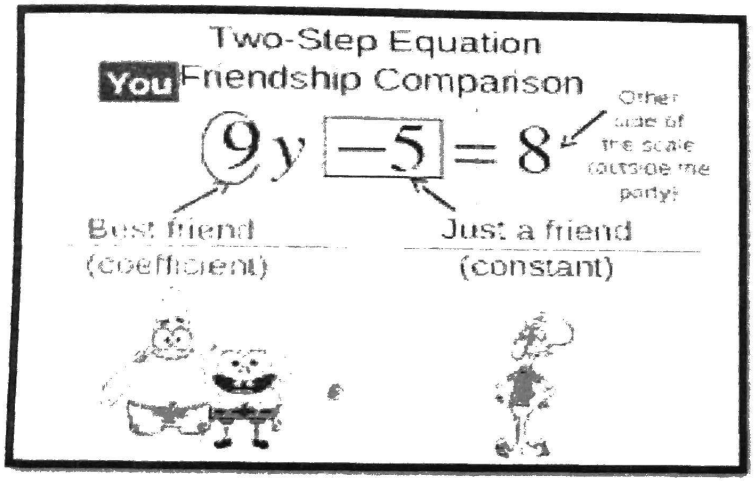
Solving Two-Step Equations

Two-step equations are like **having a party at your house**!
YOU are the VARIABLE
The operation FARTHEST from you will leave first, so undo that one FIRST.
The operation CLOSEST to you is your BFF and will stay the LONGEST, so you undo that operation LAST.
Eventually everyone goes home, and YOU, the VARIABLE, are left alone!



EXAMPLE 1:

$9y - 5 = 8$ → This equation has multiplication **and** subtraction
$+5 \quad +5$ → Use the inverse of the farthest operation
$\frac{9y}{9} = \frac{13}{9}$ → Now, undo the BFF operation!
$y = 1\frac{4}{9}$ → The variable equals $1\frac{4}{9}$!

(Also, remember to always check your answer with substitution!)

EXAMPLE 2:

$$\frac{x-3}{4} = -2$$
$$4 \cdot \left(\frac{x-3}{4}\right) = (-2) \cdot 4$$
$$x - 3 = -8$$
$$x - 3 + 3 = -8 + 3$$
$$\boxed{x = -5}$$

EXAMPLE 3:

$$-3x + 4 = 16$$
$$-4 \quad -4$$
$$\frac{-3x}{-3} = \frac{12}{-3}$$
$$x = -4$$

Let's Party!
Practice with Solving Two-Step Equations

First, let's make sure we know which step comes FIRST (that "just a friend" operation that's farthest from the variable), and which step comes LAST (your BFF operation that you will save for last). One is already done.

$\frac{x+8}{-2} = -6$ Multiply both sides by -2

$-3x + 14 = 44$ Subtract 8 from both sides

$4x - (-3) = 15$

$\frac{x+5}{3} = 10$

Now, YOU practice! Remember to SHOW ALL STEPS!

1) $3y - 10 = 8$

2) $-7a + 3 = -4$

3) $\frac{x-12}{-5} = -11$

4) $16x - (-11) = 43$

5) $\frac{1}{2}x + 18 = 24$

6) $\frac{5x}{12} = 10$