

Whatever you do to one side, you must do the other!

Examples

$$\begin{array}{r} x + 2 = 5 \\ -2 \quad -2 \text{ subtract 2 from both sides} \\ \hline x = 3 \end{array}$$
$$\begin{array}{r} 4x = 16 \\ \underline{4x \div 4 = 16 \div 4} \text{ divide both sides by 4} \\ \frac{4x}{4} = \frac{16}{4} \\ \hline x = 4 \end{array}$$

Simplify the Following Equations

- 1) $x + 2 = 11$
- 2) $x - 2 = 12$
- 3) $3x + 12 = 18$
- 4) $2x - 11 = 25$
- 5) $130 + x = 20 + 2x$
- 6) $22 + x = x + 16 + 2x$
- 7) $6x + 40 + 9x - 2x = 10x - 2 + 10x$
- 8) $5x + 40 + 4x + 9 = 11x + 16 - 5x$
- 9) $7x + 7 = 13x - 29$

ESSENTIAL QUESTION:

If you have an equation such as $5x + 15 = 45$, which step is easier and faster to do **FIRST** (If you're unsure, try solving the problem both ways to find the answer)

- 1) subtract both sides by 15
- 2) divide both sides by 5

Part II

CROSS MULTIPLYING

Example: $\frac{1}{3} = \frac{x}{6}$ cross multiply
 $3x = 6$
 $x = 2$

10) $\frac{1}{3} = \frac{9}{x}$

11) $\frac{5}{50} = \frac{x}{5}$

12) $\frac{5}{120} = \frac{x}{8}$

13) $\frac{3}{4} = \frac{12}{x}$

(Hint for #14 \rightarrow 12 can be re-written as 12/1)

14) $\frac{3}{x} = 12$

15) $\frac{21}{x} = 7$

16) $\frac{121}{x} = -11$

Proportions: Real World Application Activity

Below is a picture of a hippopotamus and its baby. Set up a proportion to find the length of the adult hippo (x).



Create Your Own Proportion Problem

Create your own real world proportion, modeled off of the hippopotamus example.

Step 1) Choose two different objects (like the baby and adult hippo)

Step 2) Set up a proportion problem to find one of the values(in the hippo example this was the width of the mother or x')

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ENJOY!!!