Solving Linear Equations

In This Unit:

1. Single Step
2. Multi-Step
3. Proportions
4. Formulas

Single Step Equations

What You Need to Know:

To solve an equation, you punish the variable-isolate it!

To isolate a variable, use the opposite operation!

Solving an equation means finding an answer for the variable!

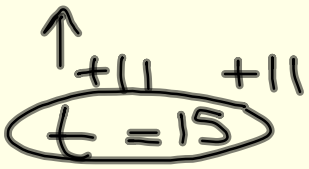
When Multiplying & Dividing:

Negative*Negative=Positive
Positive*Positive=Positive
Positive*Negative=Negative

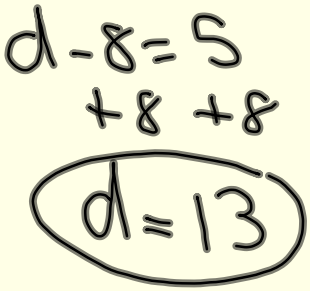
Addition & Subtraction

Solve the equation.

t-11=4

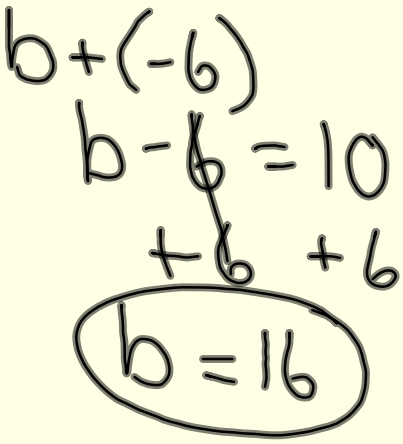


5=d-8



s+1=-8

-6+b=10 ← Be careful!



Multiplication & Division

Solve the equation.

$-12x=6$

$\frac{-12x}{-12}=\frac{6}{-12}$

$x=\frac{6}{-12}=\frac{1}{2}=-\frac{1}{2}$

$-\frac{12}{6}$

$4=24y$

$\frac{4}{24}=\frac{24y}{24}$

$y=\frac{4}{24}=\frac{1}{6}$

$y=\frac{1}{6}$

$-8\cdot\frac{k}{-8}=12\cdot-8$

$k=-96$

$\frac{2}{3}q=12\cdot\frac{3}{2}$

$q=\frac{12}{1}\cdot\frac{3}{2}=\frac{36}{2}=18$

$q=18$

$\frac{3}{4}x=-\frac{13}{2}\cdot\frac{4}{3}$

$x=-\frac{26}{3}$

Homework Assignment

Worksheet
"Single-Step Equations"

Multi-Step Equations

What You Need to Know:

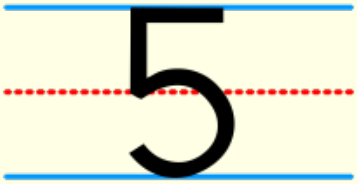
Distributive Property

$$a(b+c)=ab+ac$$

Combining Like Terms means adding or subtracting terms with the same variable parts. ex: 3x+5x=8x

When there is more than one step to solving an equation, use the five step approach.

1. Distribution?
2. Combine Like Terms?
3. Multiplication or Division?
4. Addition or Subtraction?
5. Check!



Multi-Step Equations

Solve the equation.

1. Distribution?
2. Combine Like Terms?
3. Multiplication or Division?
4. Addition or Subtraction?
5. Check!

$5y+8=-2$

$\frac{x}{4}-1=5$

$4x-8+x=2$

$6-(b+1)=9$

$10(z-2)=1+4$

$3x+2(x+5)=15$

$2(f-7)=2f-14$

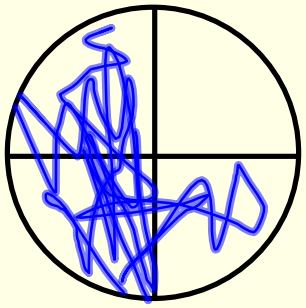
Homework Assignment

Worksheet
"Multi-Step Equations"

Proportions

What You Need to Know:

An equation created to compare a part of a whole.



$$\frac{x}{100} = \frac{3}{4}$$

If a fraction equals a fraction, "wing" it!

10(z-2)=1+4

$$\frac{x}{20} = \frac{3}{4}$$

Proportions

Solve the proportion.

$\frac{x}{16} = \frac{2}{8}$

"Wing" It!

$\frac{25}{x} = \frac{15}{6}$

$\frac{32}{8} = \frac{3}{x}$

$\frac{5}{9} = \frac{5}{3w}$

$\frac{x}{2} = \frac{x-4}{5}$

$\frac{4}{x-3} = \frac{-5}{x}$

Solving Formulas

What You Need to Know:

NOTE: Solving a formula may also be called "rewriting" the formula!

A formula is an equation that has real life application.

Treat all variables as a number, because that's what they are!

Become familiar with the list of Opposite Operations:

Addition ⟷ Subtraction
Multiplication ⟷ Division
Square ⟷ Square Root

To solve a formula for a variable, do the opposite!

Solving Formulas

Solve (rewrite) the formula for the indicated variable.

Volume of a Rectangular Prism, *w*:

$V=lwh$

Circumference of a Circle, *r*:

$C=2\pi r$

Volume of a Square Pyramid, *s*:

$V=\frac{1}{3}s^2h$

Area of a Trapezoid, b_1:

$A=\frac{1}{2}h(b_1+b_2)$

Solve for *y* (slope-intercept form):

2x+4y-6=0

Solve for *y* (slope-intercept form):

3y-x=-6

Homework Assignment

Worksheet
"Solving Proportions and Formulas"