

Solving Equations

When solving an equation, you are "undoing" the equation using inverse operations to isolate the variable. Whatever operations you use on one side of the equation, you must use on BOTH sides of the equation. (DO TO EVERYTHING on each side)

Simplify
 $\cdot 3 \uparrow \div 3$
 $+5 \downarrow -5$
 Solve

1. $3x + 5 = 26$

$$\begin{aligned} & -5 \quad -5 \\ 3x &= 21 \\ \frac{3x}{3} &= \frac{21}{3} \\ x &= 7 \end{aligned}$$

*CHECK your answer!
 (Plug it in & make sure it works!!)

Simplify
 $\cdot 3 \uparrow \div 3$
 $-12 \uparrow +12$
 $\cdot 2 \uparrow \div 2$
 $\div 3 \uparrow \cdot 3 \downarrow$
 Solve

2. $\frac{2}{3}(x - 12) = -4$

$$\begin{aligned} \frac{2(x-12)}{2} &= \frac{-12}{2} \\ x-12 &= -6 \\ +12 \quad +12 & \\ x &= 6 \end{aligned}$$

check:
 $\frac{2}{3}((6)-12) \stackrel{?}{=} -4$
 $\frac{2}{3}(-6) = -4$
 $-\frac{12}{3} = -4 \checkmark$

Simplify
 $\cdot 3 \uparrow \div 3$
 $-x \uparrow +x$
 $\cdot 2 \uparrow \div 2$
 $\cdot 3 \uparrow \div 3$
 Solve

3. $3x + 8 = x + 18$

$$\begin{aligned} & -x \quad -x \\ 2x+8 &= 18 \\ & -8 \quad -8 \\ \frac{2x}{2} &= \frac{10}{2} \\ x &= 5 \end{aligned}$$

check:
 $3(5)+8 \stackrel{?}{=} (5)+18$
 $15+8 = 23$
 $23 = 23 \checkmark$

If x on BOTH sides, move them together on same side!

A literal equation is an equation with more than one variable. When solving a literal equation, your solution will have one or more variables in it.

$PV = nrt$, solve for r .

$$\frac{PV}{nt} = \frac{nt \cdot r}{nt}$$

$$r = \frac{PV}{nt}$$

$s = \frac{(v+u)t}{2}$, solve for u

$$2(s) = \frac{(v+u)t}{2} \cdot 2$$

$$\frac{2s}{t} = \frac{(v+u)t}{t}$$

$$\frac{2s}{t} = v+u$$

$$-v \quad -v$$

$$u = \frac{2s}{t} - v$$

Simplify
 $+v \uparrow -v$
 $\cdot t \uparrow \div t$
 $\div 2 \uparrow \cdot 2 \downarrow$
 Solve