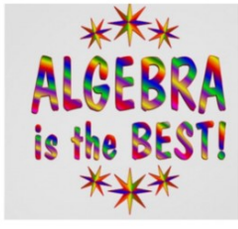

Solving Equations using Algebra

To solve an equation, we need to isolate the variable on one side of the equation.(Get the letter alone)

To do this, we get rid of the numbers on that side of the equation by using the reverse operation.

opposite to add is subtract

opposite to multiply is divide

When we solve an equation using algebra, we must also preserve the equality.

(What you do to one side of the equal sign then you must to the the other side of the equal sign)

Whatever we do to one side of the equation, we must do to the other side, too.

Solve using algebra (reverse operations)

We want the VARIABLE (Letter) alone. So, whatever you want to get rid of you do the opposite operation to it

a) $2p - 5 = 7$

$2p - 5 + 5 = 7 + 5$

$2p = 12$

$\frac{2p}{\div 2} = \frac{12}{\div 2}$

$p = 6$

Verify

LHS: $2p - 5$

Sub $p = 6$: $2(6) - 5$

$12 - 5$

7

RHS: 7

same ✓

b) $2 + 3a = -4$

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

$3a = -6$

$\frac{3a}{3} = \frac{-6}{3}$

$a = -2$

You Try

Solve each equation.

a) $-2x + 4 = 28$

$-2x + 4 - 4 = 28 - 4$

$-2x = 24$

$\frac{-2x}{-2} = \frac{24}{-2}$ (÷(-2) ÷(-2))

$x = -12$

b) $\frac{a}{5} = 60$

$5 \times \frac{a}{5} = 60 \times 5$

$a = 300$

c) $-45 = 6w - 15$

$-45 + 15 = 6w - 15 + 15$

$-30 = 6w$

$\frac{-30}{6} = \frac{6w}{6}$

$-5 = w$

d) $\frac{w}{6} + 4 = 1$

$\frac{w}{6} + 4 - 4 = 1 - 4$

$\frac{w}{6} = -3$

$6 \times \frac{w}{6} = -3 \times 6$

$w = -18$

e) $\frac{p}{3} - 10 = 15$

$\frac{p}{3} - 10 + 10 = 15 + 10$

$\frac{p}{3} = 25$

$3 \times \frac{p}{3} = 25 \times 3$

$p = 75$

Distribution property (Number outside the bracket)

- When there is a number outside a bracket then that number is multiplied to each term inside the bracket and then we do the same steps as before to isolate the variable

$$4(x-3)=20$$
$$4(x)-4(3)=20$$
$$4x-12=20$$
$$4x-12+12=20+12$$
$$4x=32$$
$$\frac{4x}{4}=\frac{32}{4}$$
$$x=8$$

You Try

Ex) 4 (2k- 7) = -12

Ex) -3 (x+ 5) = +21