

## Topic: Solving equations

Topic/Skill	Definition/Tips	Example
1. Solve one step equations	To find the <b>answer</b> /value of something  <b>Use inverse operations</b> on both sides of the equation (balancing method) until you find the value for the letter.	Solve $6x = 30$ $\begin{array}{ccc} & 6x = 30 & \\ \div 6 \swarrow & & \searrow \div 6 \\ & x = 5 & \end{array}$ Divide by 6 on both sides
2. Solve two step equations	To find the <b>answer</b> /value of something  <b>Use inverse operations</b> on both sides of the equation (balancing method) until you find the value for the letter.	Solve $2x - 3 = 7$ $\begin{array}{ccc} & 2x - 3 = 7 & \\ +3 \swarrow & & \searrow +3 \\ & 2x = 10 & \\ \div 2 \swarrow & & \searrow \div 2 \\ & x = 5 & \end{array}$ Add 3 on both sides Divide by 2 on both sides
3. Solving with letters on both sides of the equation	To find the <b>answer</b> /value of something  Take away the <b>smallest amount</b> of the letter from both sides.  <b>Use inverse operations</b> on both sides of the equation (balancing method) until you find the value for the letter.	Solve $4x - 3 = 2x + 1$ $\begin{array}{ccc} & 4x - 3 = 2x + 1 & \\ -2x \swarrow & & \searrow -2x \\ & 2x - 3 = 1 & \\ +3 \swarrow & & \searrow +3 \\ & 2x = 4 & \\ \div 2 \swarrow & & \searrow \div 2 \\ & x = 2 & \end{array}$ Subtract 2x from both sides Add 3 on both sides Divide by 2 on both sides
4. Solving equations with brackets	To find the <b>answer</b> /value of something  <b>Expand</b> the bracket first  <b>Use inverse operations</b> on both sides of the equation (balancing method) until you find the value for the letter.	Solve $2(x - 3) = 8$ $\begin{array}{ccc} & 2x - 6 = 8 & \\ +3 \swarrow & & \searrow +3 \\ & 2x - 3 = 7 & \\ \div 2 \swarrow & & \searrow \div 2 \\ & x = 5 & \end{array}$ Expand the brackets by multiplying all of the terms inside the bracket by the term on the outside Add 3 on both sides Divide by 2 on both sides
5. Substitution	<b>Replace letters with numbers.</b>  Be careful of $5x^2$ . You need to square first, then multiply by 5.	$a = 3, b = 2$ and $c = 5$ . Find: 1. $2a = 2 \times 3 = 6$ 2. $3a - 2b = 3 \times 3 - 2 \times 2 = 5$ 3. $7b^2 - 5 = 7 \times 2^2 - 5 = 23$
6. Rearranging formulae	You want to change what the equation is equal to, we call this the subject.  <b>Use inverse operations</b> on both sides of the equation (balancing method) until you get the letter on its own.	Make p the subject $\begin{array}{ccc} & r = 3p - t & \\ +t \swarrow & & \searrow +t \\ & r + t = 3p & \\ \div 3 \swarrow & & \searrow \div 3 \\ & \frac{r + t}{3} = p & \end{array}$