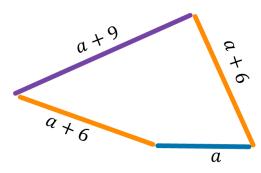
Y8 Mastery Unit 2 - Forming and solving equations			Other Topics/Units this could appear in:• Expressions & • Factorising substituting into • Solving Equations simple formulae • Subject of • Expand and simplify• Inequalities	
Solving Equations When we are solving equations, we need to figure out the value of the variable (usually a letter) in the equation.				
t Variable	Equations work like a weighing scale; it	Keyword/Skill	Definition/Tips	
$4x^{-} 7 = 5$	must always be balanced/equal. If I remove something from one side, I need to remove the same from the other side to keep it balanced/equal.	Variable	A symbol for a number we do not know yet, it is usually a letter.	
One-Step Equations		Term	Either a single number or a <b>variable</b> , such as 4 or n or 3a or 6y.	
x + 5 = 12	This is a one-step equation. There is only one thing happening to the variable (add 5).	Expression	A mathematical statement written using <b>symbols</b> , <b>numbers</b> or <b>letters</b> .	
	We can turn this into a bar model to help us	Equation	A statement showing that <b>two</b> expressions are equal.	
x 5	solve it:		Shows the <b>relationship</b> between <b>two or more variables.</b>	
12	This shows that x+5 is equal to (the same as) 12.	Simplifying Expressions	<b>Collect 'like terms'.</b> Be careful with negatives. $x^2$ and x are not like terms.	
x 5	If we take the 5 away from both bars we can see that x must be 7. $x + 5 = 12$	Substitute	In algebra it means replacing letters with numbers.	
7 5		Expand	When we <b>multiply</b> a <b>term</b> across a bracket, e.g. 3(a + 2) = 3a + 6	
x = 7	bars we can see that x must be 7. x + 5 = 12 $-5$ $x = 7$	Factorise	The <b>inverse</b> of <b>expand</b> . When we divide an <b>expression</b> by all <b>common factors</b> or <b>terms</b> , e.g. 6g + 4 = 2(3g + 2) and $a^2 - 2a = a(a - 2)$	

Y8 Mastery Unit 2	Other Topics/ could appea		
$\frac{\text{Two-Step Equations}}{2x + 12 = 28}$	This is a one-step equation. There are two things happening to the variable (multiply by 2 and add 12).		ns & • Factorising ng into • Solving Equations rmulae • Subject of and simplify• Inequalities
$\underline{ZX}$ + $\underline{IZ}$ = $\underline{ZO}$			Definition/Tips
x x 12		Variable	A symbol for a number we do not know yet, it is usually a letter.
28	This shows that 2x+12 is equal to (the same as) 28.		Either a single number or a <b>variable</b> , such as 4 or n or 3a or 6y.
	Take the 10 autout from both bare	Expression	A mathematical statement written using <b>symbols</b> , <b>numbers</b> or <b>letters</b> .
x x 12	Take the 12 away from both bars.	Equation	A statement showing that <b>two</b> expressions are equal.
<mark>16</mark> 12	We can now see that 2 x's are equal (the same as) to 16.	Formula	Shows the <b>relationship</b> between <b>two or more variables</b> .
<u>2x</u> = 16	2x + 12 = 28	Simplifying Expressions	Collect 'like terms'. Be careful with negatives. $x^2$ and x are not like terms.
	-12 -12	Substitute	In algebra it means replacing letters with numbers.
x x 12	$\frac{2x}{1 \text{ have } 2 \text{ x's so I divide } 16} \qquad 2x = 16 < 10$	Expand	When we <b>multiply</b> a <b>term</b> across a bracket, e.g. 3(a + 2) = 3a + 6
8 8 12	by 2 to work out the $\div 2$ $x = 8$ $\div 2$ $x = 8$	Factorise	The <b>inverse</b> of <b>expand</b> . When we divide an <b>expression</b> by all <b>common factors</b> or <b>terms</b> , e.g.
x = 8			6g + 4 = 2(3g + 2) and $a^2 - 2a = a(a - 2)$

## Forming and Solving Equations (challenge)

Here is a four sided shape. The sides are labelled algebraically. We can find an expression for the perimeter by adding up the sides (like we do when finding the perimeter with numbered sides).



Here are my sides laid out next to each other ready to add together (you don't have to draw the sides, it's the labels that are important).

$$\left(\begin{array}{c} a + (a+6) + (a+9) + (a+6) \\ \end{array}\right) = 4$$

= 4a + 21 (simplified)

I may then be told that the perimeter of my shape is actually 60cm. I can use this information to form an equation

$$4a + 21 = 60$$

This is a two-step equation that you can then solve (use the section on 'two-step equations' on the previous page).

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		Other Topics/ could appear • Expression substitutin simple for • Expand a	r <u>in:</u> ns & • Factorising ng into • Solving Equations		
		Keyword/Skill	Definition/Tips		
)	Variable	A symbol for a number we do not know yet, it is usually a letter.			
	Term	Either a single number or a <b>variable</b> , such as 4 or n or 3a or 6y.			
		Expression	A mathematical statement written using <b>symbols</b> , <b>numbers</b> or <b>letters</b> .		
	Equation	A statement showing that <b>two</b> expressions are equal.			
	Formula	Shows the <b>relationship</b> between <b>two or more variables</b> .			
	Simplifying Expressions	<b>Collect 'like terms'.</b> Be careful with negatives. $x^2$ and x are not like terms.			
	Substitute	In algebra it means replacing letters with numbers.			
	Expand	When we <b>multiply</b> a <b>term</b> across a bracket, e.g. $3(a + 2) = 3a + 6$			
		Factorise	The <b>inverse</b> of <b>expand</b> . When we divide an <b>expression</b> by all <b>common factors</b> or <b>terms</b> , e.g. 6g + 4 = 2(3g + 2) and $a^2 - 2a = a(a - 2)$		