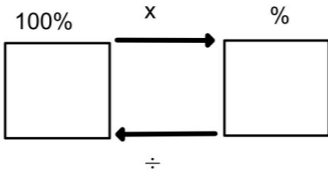


MATHEMATICS - YEAR 10 FOUNDATION - BLOCK 1

A EXPANDING AND FACTORISING

1	Quadratic expression	An expression where the highest power of x is x^2
2	Expand	Multiply each term in the bracket by the term outside of the bracket
3	Factorise	The reverse of expanding brackets. An expression will factorise into single brackets if it has a common factor other than 1.
4	Expand double brackets	Write as single brackets, then expand. E.g. $= (x + 3)(x + 2)$ $= x(x + 2) + 3(x + 2)$ $= x^2 + 2x + 3x + 6$ $= x^2 + 5x + 6$
5	Factorise using the difference of two squares	A quadratic of the form $x^2 - a^2$ can be written as $(x + a)(x - a)$. E.g. $x^2 - 9 = (x + 3)(x - 3)$
6	Factorise into double brackets	Factorise using the sum and product. E.g. $x^2 + 5x + 6$ The sum is 5 and the product is 6. The numbers are 3 and 2. So the expression is $(x + 3)(x + 2)$
7	Solving quadratic equations by factorisation	Factorise, then set each factorised expression to zero and solve. E.g. $(x + 3)(x + 2) = 0$ Either $x + 3 = 0$, so $x = -3$ or $x + 2 = 0$, so $x = -2$

B PERCENTAGE MULTIPLIERS

1	Percentage Box method	
2	Percentage multiplier	The decimal equivalent of a percentage used to find a percentage of a quantity
3	Percentage change	$\frac{\text{change}}{\text{original}}$ then turn into a percentage
4	Simple interest	Initial + (initial \times multiplier \times time) : E.g. £600 invested at 3% simple interest for 5 years would be: $600 + (600 \times 0.03 \times 5) = £690$
5	Compound interest	Initial \times multiplier ^{time} : E.g. £600 invested at 3% compound interest for 5 years would be: $600 \times 1.03^5 = £695.56$

C PYTHAGORAS' THEOREM

1	Pythagoras' Theorem	$a^2 + b^2 = c^2$
2	Hypotenuse	The longest side of a right-angled triangle. It is always opposite the right angle.
3	Finding a long side using Pythagoras' Theorem	$a^2 + b^2 = c^2$
4	Finding a short side	$b^2 = c^2 - a^2$
5	Identifying if a triangle is right-angled	A triangle is right-angled if Pythagoras' Theorem is true, if: $a^2 + b^2 = c^2$

D RATIO

1	Write in the form 1 : n	Divide both sides by the number you need to divide the left hand side by to get 1. E.g. to write 4 : 10 in the form 1 : n you would divide both sides by 4, giving $1 : 2\frac{1}{2}$
2	Write a ratio as a fraction	E.g. in the ratio 3 : 8, the total number of parts is 11. So the fraction represented by the 3 would be $\frac{3}{11}$
3	Write a fraction as a ratio	E.g. in the fraction $\frac{5}{9}$, there are 9 parts in total. 5 is given, so 4 must be the unknown ($9 - 5 = 4$). The ratio is 5 : 4.
4	Find a : b : c given a : b and b : c	Stack the ratios, lining up the common parts. If $a : b = 3 : 5$ and $b : c = 4 : 7$, then b is shared. $a : b : c$ $3 : 5$ $4 : 7$ Find the LCM of the shared part (LCM of 5 and 4 = 20). Multiply each ratio so that b is equal to 20. $a : b : c$ $12 : 20$ $20 : 35$ Rewrite as a : b : c in its simplest form 12 : 20 : 35