Year 8 Knowledge Organiser SIMPLIFYING & MANIPULATING ALGEBRA

Key Concept

Formula V = u + at

Expression $f^2 + f^2 + f^2$

Equation 34 = 12 + 6t

 $c \times c = c^2$

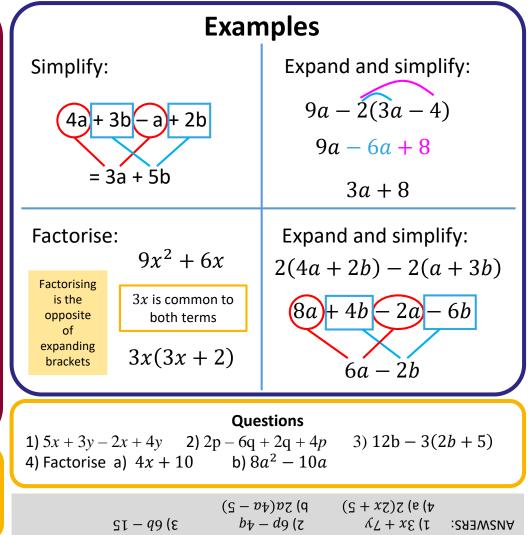
A hegartymaths Clip Numbers 154-169, 548-550

Key Words

Formula: A rule written using symbols that describe a relationship between different quantities. **Expression:** Shows a mathematical relationship whereby there is no solution. Equation: A mathematical statement that shows that two expressions are equal. **Identity:** A relation which is true. No matter what values are chosen. Tip When expanding

brackets be careful with

negatives.



Year 8 Knowledge Organiser SOLVING EQUATIONS

Examples Key Concept Key Words Inverse Operations х x + 9 = 16x - 12 = 202x + 5 = 14 $\frac{3}{3} = 5$ Unknown: A letter -9 -9 -5 -5 +12 +12 which represents a ×3 ×3 Operation Inverse x = 7 x = 32 2x = 9 ÷2 ÷2 number we do not x = 15 + x = 4.5know the value of. **Terms:** The numbers + and letters in the $\frac{\pi}{4} - 2 = 4$ 2x + 7 = 5x + 12(3x + 5) = -14expression or -2x expand X <u>•</u> equation. +2 +2 (smallest x term) 6x + 10 = -14Inverse: The +7 = 3x + 1<u>•</u> -10 -10 X $\frac{x}{4} = 6$ operation which will -1 -1 6x = - 24 do the opposite. **x**² $\sqrt{\mathbf{x}}$ ÷6 ÷6 6 = 3x ×4 ×4 ÷3 ÷3 x = -4x = 24 2 = x Tip A hegartymaths Questions Answers can be: **Clip Numbers** 2) y - 25 = 15 3) 2y = 82 4) $\frac{t}{4} = 7$ Integers 1) x + 8 = 19 177 - 184Decimals 5) $\frac{p}{2} - 6 = 2$ 6) 3(2x - 3) = 15 7) 4x - 8 = 2x + 1 Fractions negatives ANSWERS: 1) x = 11, 2) y = 40, 3) y = 41, 4) t = 28, 5) p = 16, 6) x = 4, 7) x = 4.5

Year 8 Knowledge Organiser EXPRESSIONS/EQUATIONS/IDENTITIES AND SUBSTITUTION

Key Concepts

A **formula** involves two or more letters, where one letter equals an **expression** of other letters.

An **expression** is a sentence in algebra that does NOT have an equals sign.

An **identity** is where one side is the equivalent to the other side.

When **substituting** a number into an expression, replace the letter with the given value.

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153, 189
Key Words
Substitute
Equation
Formula
Identity
Expression

Examples $5(y+6) \equiv 6y+30$ is an identity as when the brackets are 1) expanded we get the answer on the right hand side 5m - 7 is an expression since there is no equals sign 2) 3) 3x - 6 = 12 is an equation as it can be solved to give a solution 4) $C = \frac{5(F-32)}{2}$ is a formula (involves more than one letter and includes an equal sign) 5) Find the value of 3x + 2 when x = 5 $(3 \times 5) + 2 = 17$ Where $A = b^2 + c$, find A when b = 2 and c = 36) $A = 2^2 + 3$ A = 4 + 3A = 7 Questions 1) Identify the equation, expression, identity, formula from (b) $u^2 - 2as$ the list (a) v = u + at(c) $4x(x - 2) = x^2 - 8x$ (d) 5b - 2 = 13**2)** Find the value of 5x - 7 when x = 3**3)** Where $A = d^2 + e$, find A when d = 5 and e = 272 = A(E)5) 8 uoitenps (b) (c) Identity (p) exbression ANSWERS: 1) (a) formula