Year 9
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.

Examples

1) $5(y + 6) \equiv 6y + 30$ is an identity as when the brackets are expanded we get the answer on the right hand side

2) $5m - 7$ is an expression since there is no equals sign

3) $3x - 6 = 12$ is an equation as it can be solved to give a solution

4) $C = \frac{5(F - 32)}{9}$ is a formula (involves more than one letter and includes an equal sign)

5) Find the value of $3x + 2$ when $x = 5$

$(3 \times 5) + 2 = 17$

6) Where A = b² + c, find A when b = 2 and c = 3

$A = 2^2 + 3$

$A = 4 + 3$

$A = 7$

Questions

1) **Identify the equation, expression, identity, formula from the list** (a) $v = u + at$

(b) $u^2 - 2as$ 　　　　　　　　　　(c)

$4x(x - 2) = x^2 - 8x$ 　　(d) 　5b – 2 = 13

2) Find the value of $5x - 7$ when $x = 3$

3) Where A = d² + e, find A when d = 5 and e = 2

Key Words

Substitute
Equation
Formula
Identity
Expression

ANSWERS: 1) (a) formula 　(b) expression 　(c) identity 　(d) equation 　2) 8

Year 9
ALGEBRAIC EXPRESSIONS

Key Concepts

When collecting like terms involving addition or subtraction, add/subtract the numbers in front of the letters.

If the like terms are multiplied, multiply the numbers in front of the letters and put the letters next to each other.

If the like terms are divided, divide the numbers in front of the letters.

Examples

Simplify the following expressions:

1) $4p + 6t + p - 2t = 5p + 4t$
2) $3 + 2t + p - t + 2 = 5 + t + p$
3) $f + 3g - 4f = 3g - 3g$
4) $f^2 + 4f^2 - 2f^2 = 3f^2$
5) $6a \times 3b \times 2c = 36abc$
6) $\dfrac{9b}{3} = 3b$

Key Words
Simplify
Term
Collect

Questions

Simplify:

1) $7p + 3q + p - 3q$
2) $5 + 4t + 3p - 2t + 7$
3) $m - 8g - 5m + 2b^2$
4) $b^2 - 7b^2$
5) $2a \times 5b \times 4c$
6) $8m \times 3n \times 2m$

ANSWERS: 4) $-4b^2$ 5) 40abc 6) 48m²n 7) 3p 8) $\frac{t}{3}$