

Factoring Polynomials

To factor a polynomial is to write it as a product.

Example: $5x^2 + 10x$ can be written as $5x(x + 2)$.

a) Removing the Common Factor

A common factor divides evenly into each term of the polynomial.

Example: Factor $4ab + 6b^2$

i) Determine the GCF for the coefficients and the variables.

2 is the GCF of 4 and 6.

b is the GCF of ab and b^2 .

$\therefore 2b$ is the GCF of the polynomial (and the first factor).

ii) Divide the polynomial by the GCF (to get the second factor).

$$\frac{4ab + 6b^2}{2b} = 2a + 3b$$

iii) Write the polynomial as the product of the two factors.

$$\therefore 4ab + 6b^2 = 2b(2a + 3b)$$

Example: Factor $12x^2y^3 - 27xy^2z$

$$3xy^2(4xy - 9z)$$

Example: Factor $3a(a - 7) + 5(a - 7)$

$$(a - 7)(3a + 5)$$

Factor each of the following:

a) $21xy - 28xyz$

b) $18a^2b + 30ab^2c^3$

c) $3(2d - 1) + d(2d - 1)$

$$d) (b-4)(b+2) + (b-5)(b+2)$$