Factorising General Algebraic Expressions

Examples

1) $6a^2b + 9ab^3$

$= 3ab(2a + 3b^2)$

2) $8p^4q^2r^3 - 6p^3q^3r^3 + 4p^2q^5r^3$

$= 2p^2q^2r^3(4p^2 - 3pq + 2q^3)$

3) $4h^2k^3 + 2hk^2$

$= 2hk^2(2hk + 1)$

Exercise

Factorise

1) $6a^4b^3 + 3a^3b^4$

$= 3a^3b^3(2a + b)$

2) $10x^4y^2 - 7x^2y^2$

$= x^2y^2(10x^2 - 7)$

3) $5m^2k^3 - 10mk^2 + 15mk^4$

$= 5mk^2(mk - 2 + 3k^2)$

Expanding and/or Simplifying

Examples

1) $3p^2q^4 \times 4p^5q^2 = 12p^7q^6$

2) $\dfrac{4h^2k^3 \times 5hkm^2}{2hm^3} = \dfrac{20h^3k^4m^2}{2hm^3}$

$= 10h^2k^4m^{-1}$

or $\dfrac{10h^2k^4}{m}$

3) $4(2x - y) - 3(3x + 2y)$

$= 8x - 4y - 9x - 6y$

$= -x - 6y$

4) $(2x+3)(x-7)$

$= 2x^2 + 3x - 14x - 21$

$= 2x^2 - 11x - 21$

Exercise

1) $4x^2y^3 \times 3x^4y^3z^2$

$= 12x^6y^6z^2$

2) $\dfrac{4h^5k^2 \times 3h^3k^4m^2}{6h^{10}k^3m^2} = \dfrac{12h^8k^6m^2}{6h^{10}k^3m^2} = \dfrac{2k^3}{h^2}$

or $2h^{-2}k^3$

3) $(3x+2)(2x+3)$

$= 6x^2 + 4x + 9x + 6$

$= 6x^2 + 13x + 6$

4) $(5x-2)(x-4)$

$= 5x^2 - 2x - 20x + 8$

$= 5x^2 - 22x + 8$

Trinomial Expansion

Example

$$(2x+1)(3x+2)(4x+3)$$

$$= \left[6x^2 + 3x + 4x + 2\right](4x+3)$$

$$= \left[6x^2 + 7x + 2\right](4x+3)$$

$$= 24x^3 + 28x^2 + 8x$$
$$+ 18x^2 + 21x + 6$$

$$= 24x^3 + 46x^2 + 29x + 6$$
