

Factorising Quadratic Expressions

Expressions with Multiple x^2

Ex 1

$$\begin{array}{l} 3 \times 8 \\ = 24 \\ + 4 + 6 \end{array}$$

$$\begin{aligned} & 3x^2 + 10x + 8 \\ &= 3x^2 + 4x + 6x + 8 \\ &= x(3x + 4) + 2(3x + 4) \\ &= (x + 2)(3x + 4) \end{aligned}$$

Ex 2

$$\begin{array}{l} 6 \times -5 \\ = -30 \\ + 5 - 6 \end{array}$$

$$\begin{aligned} & 6x^2 - x - 5 \\ &= 6x^2 + 5x - 6x - 5 \\ &= x(6x + 5) - 1(6x + 5) \\ &= (x - 1)(6x + 5) \end{aligned}$$

Ex 3

$$\begin{array}{l} 8 \times -3 \\ = -24 \\ -1 + 24 \end{array}$$

$$\begin{aligned} & 8x^2 + 23x - 3 \\ &= 8x^2 - x + 24x - 3 \\ &= x(8x - 1) + 3(8x - 1) \\ &= (x + 3)(8x - 1) \end{aligned}$$

Exercice

Factorize

1)

$$\begin{array}{l} 2 \times 14 \\ = 28 \\ + 2 + 7 \end{array}$$

$$2x^2 + 11x + 14$$

$$= 2x^2 + 4x + 7x + 14$$

$$= 2x(x+2) + 7(x+2)$$

$$= (2x+7)(x+2)$$

2)

$$\begin{array}{l} 5x-6 \\ = -30 \\ + 3 - 10 \end{array}$$

$$5x^2 - 7x - 6$$

$$= 5x^2 + 3x - 10x - 6$$

$$= x(5x+3) - 2(5x+3)$$

$$= (x-2)(5x+3)$$

3)

$$\begin{array}{l} 4 \times 9 \\ = 36 \\ - 6 - 6 \end{array}$$

$$4x^2 - 12x + 9$$

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

$$= 2x(2x-3) - 3(2x-3)$$

$$= (2x-3)(2x-3)$$
