

Factorisations

Factoriser si possible les expressions ci-dessous. Lorsque c'est possible, factoriser au maximum.

$$A = x^2 - 3x$$

$$B = x^2 - 3$$

$$C = x^2 + 3$$

$$D = 6x^2 + 18x$$

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

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

$$G = 3x^3 - 27x$$

$$H = (x+5)(3x-1) - (2x+10)(5x-2)$$

$$I = (2x+1)^2 - (x+2)^2$$

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

$$K = x^4 + 2x^3 + x^2$$

$$L = 36x^2 - 16(2x-7)^2$$

$$M = 2(x+3)(2x-1) + x^2 - 9$$

Réponses

$$A = x(x-3)$$

$$B = (x-\sqrt{3})(x+\sqrt{3})$$

C n'est pas factorisable en facteurs du premier degré.

$$D = 6x(x+3)$$

$$E = 4(4x+1)(x-1)$$

$$F = (x+2)(5x-4)$$

$$G = 3x(x-3)(x+3)$$

$$H = (x+5)(-7x+3)$$

$$I = 3(x+1)(x-1)$$

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

$$K = x^2(x+1)^2$$

$$L = 28(x-2)(-x+14)$$

$$M = 5(x+3)(x-1)$$

Solutions détaillées

$$A = x^2 - 3x$$

$$A = x(x-3)$$

$$B = x^2 - 3$$

$$B = x^2 - (\sqrt{3})^2$$

$$B = (x - \sqrt{3})(x + \sqrt{3})$$

$C = x^2 + 3$ ne se factorise pas.

$$D = 6x^2 + 18x$$

$$D = 6x \times x + 6x \times 3$$

$$D = 6x(x+3)$$

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

$$E = [5x + (3x+2)][5x - (3x+2)]$$

$$E = (8x+2)(2x-2)$$

$$E = 2(4x+1) \times 2(x-1)$$

$$E = 4(4x+1)(x-1)$$

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

$$F = (x+2)(5x-3) - 1 \times (x+2)$$

$$F = (x+2)[(5x-3) - 1]$$

$$F = (x+2)(5x-4)$$

$$G = 3x^3 - 27x$$

$$G = 3x \times x^2 - 3x \times 9$$

$$G = 3x(x^2 - 9) \quad (\text{avant dernière ligne facultative, surtout en } 2^\circ \text{ !})$$

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

$$G = 3x(x+3)(x-3)$$

$$H = (x+5)(3x-1) - (2x+10)(5x-2)$$

$$H = (x+5)(3x-1) - 2(x+5)(5x-2)$$

$$H = (x+5)[(3x-1) - 2(5x-2)]$$

$$H = (x+5)(3x-1-10x+4)$$

$$H = (x+5)(-7x+3)$$

$$I = (2x+1)^2 - (x+2)^2$$

$$I = [(2x+1) + (x+2)][(2x+1) - (x+2)]$$

$$I = (3x+3)(2x+1-x-2)$$

$$I = (3x+3)(x-1)$$

$$I = 3(x+1)(x-1)$$

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

$$J = x^2 - 2 \times x \times 3 + 3^2$$

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

$$K = x^4 + 2x^3 + x^2$$

$$K = x^2(x^2 + 2x + 1) \quad (x^4 = x^2 \times x^2 ; x^3 = x^2 \times x)$$

$$K = x^2(x+1)^2 \quad (\text{on observe juste que } x^2 + 2x + 1 = (x+1)^2 ; \text{ identit  remarquable})$$

$$L = 36x^2 - 16(2x-7)^2$$

$$L = (6x)^2 - [4(2x-7)]^2$$

$$L = [6x - 4(2x-7)][6x + 4(2x-7)]$$

$$L = (6x - 8x + 28)(6x + 8x - 28)$$

$$L = (-2x + 28)(14x - 28)$$

$$L = 2(-x + 14) \times 14(x - 2)$$

$$L = 28(x-2)(-x+14)$$

$$M = 2(x+3)(2x-1) + x^2 - 3^2$$

$$M = 2(x+3)(2x-1) + (x-3)(x+3)$$

$$M = (x+3)[2(2x-1) + (x-3)]$$

$$M = (x+3)(4x-2+x-3)$$

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

$$M = (x+3) \times 5(x-1)$$

$$M = 5(x+3)(x-1)$$