

### Exercice 1

$$\begin{aligned} &= \frac{4(6x + 3) - 12(2x - 3) - 3(8x + 4)}{144} \\ &= \frac{24x + 12 - 24x + 36 - 24x - 12}{144} \\ &= \frac{-24x + 36}{144} = \frac{12(-2x + 3)}{144} = \frac{-2x + 3}{12} \end{aligned}$$

### Exercice 2

$$\begin{aligned} &= \frac{x + 1}{2(x - 1)} - \frac{x - 1}{2(x + 1)} - \frac{4x}{(x + 1)(x - 1)} + \frac{x^2 + 1}{(x + 1)(x - 1)} \\ &= \frac{(x + 1)(x + 1) - (x - 1)(x - 1) - 2 \cdot 4x + 2(x^2 + 1)}{2(x + 1)(x - 1)} \\ &= \frac{x^2 + 2x + 1 - (x^2 - 2x + 1) - 8x + 2x^2 + 2}{2(x + 1)(x - 1)} \\ &= \frac{x^2 + 2x + 1 - x^2 + 2x - 1 - 8x + 2x^2 + 2}{2(x + 1)(x - 1)} \\ &= \frac{2x^2 - 4x + 2}{2(x + 1)(x - 1)} = \frac{2(x^2 - 2x + 1)}{2(x + 1)(x - 1)} = \frac{2(x - 1)^2}{2(x + 1)(x - 1)} = \frac{x - 1}{x + 1} \end{aligned}$$

### Exercice 3

$$\begin{aligned} &= \frac{12}{(3 + x)(3 - x)} - \frac{4}{3 + x} + \frac{2}{x - 3} \\ &= \frac{12 - 4(3 - x) - 2(3 + x)}{(3 + x)(3 - x)} \\ &= \frac{12 - 12 + 4x - 6 - 2x}{(3 + x)(3 - x)} \\ &= \frac{2x - 6}{(3 + x)(3 - x)} = \frac{2(x - 3)}{(3 + x)(3 - x)} = \frac{-2}{x + 3} \end{aligned}$$

### Exercice 4

Factoriser le numérateur et le dénominateur : division par  $x + 3$  et trinôme

$$= \frac{(x + 3)(6x^2 - 19x + 10)}{(x + 3)(3x - 2)} = \frac{(x + 3)(3x - 2)(2x - 5)}{(x + 3)(3x - 2)} = 2x - 5$$

Exercise 5

$$\begin{aligned}20x^2 - 16x - 25x + 20 - (6x^2 - 4x - 9x + 6) &= 14x^2 + 7x - 56 \\20x^2 - 16x - 25x + 20 - 6x^2 + 4x + 9x - 6 &= 14x^2 + 7x - 56 \\14x^2 - 28x + 14 &= 14x^2 + 7x - 56 \\-35x &= -70 \\x &= \frac{-70}{-35} \\S &= \{2\}\end{aligned}$$

Exercise 6

$$\begin{aligned}48 - (12 - 3x - 4x + x^2) &= x - x^2 \\48 - 12 + 3x + 4x - x^2 &= x - x^2 \\6x &= -36 \\x &= \frac{-36}{6} \\S &= \{-6\}\end{aligned}$$

Exercise 7

$$\begin{aligned}&= (3x^3)^3 - (4y^2)^3 \\&= (3x^3 - 4y^2)[(3x^3)^2 + 3x^3 \cdot 4y^2 + (4y^2)^2] \\&= (3x^3 - 4y^2)(9x^6 + 12x^3y^2 + 16y^4)\end{aligned}$$

Exercise 8

$$\begin{aligned}&= (4x^2)^3 + (5)^3 \\&= (4x^2 + 5)[(4x^2)^2 - 4x^2 \cdot 5 + 5^2] \\&= (4x^2 + 5)(16x^4 - 20x^2 + 25)\end{aligned}$$