

2.4

1) $x^2 - x - 132 = (x + 11)(x - 12)$

2) $-y + y^2 - 12 = y^2 - y - 12 = (y + 3)(y - 4)$

3) $x^2 + 12 - 8x = x^2 - 8x + 12 = (x - 2)(x - 6)$

4) Résolvons l'équation $2x^2 + 9x + 7 = 0$.

$$\Delta = 9^2 - 4 \cdot 2 \cdot 7 = 25 = 5^2 > 0$$

$$x_1 = \frac{-9-5}{2 \cdot 2} = -\frac{7}{2} \quad x_2 = \frac{-9+5}{2 \cdot 2} = -1$$

$$2x^2 + 9x + 7 = 2\left(x + \frac{7}{2}\right)(x + 1) = (2x + 7)(x + 1)$$

5) $2x^2 - 2x - 24 = 2(x^2 - x - 12) = 2(x + 3)(x - 4)$

6) $6x^2 + 15x + 6 = 3(2x^2 + 5x + 2)$

Résolvons l'équation $2x^2 + 5x + 2 = 0$.

$$\Delta = 5^2 - 4 \cdot 2 \cdot 2 = 9 = 3^2 > 0$$

$$x_1 = \frac{-5-3}{2 \cdot 2} = -2 \quad x_2 = \frac{-5+3}{2 \cdot 2} = -\frac{1}{2}$$

$$2x^2 + 5x + 2 = 2\left(x + 2\right)\left(x + \frac{1}{2}\right) = (x + 2)(2x + 1)$$

$$6x^2 + 15x + 6 = 3(2x^2 + 5x + 2) = 3(x + 2)(2x + 1)$$

7) $27x^2 - 75x + 48 = 3(9x^2 - 25x + 16)$

Résolvons l'équation $9x^2 - 25x + 16 = 0$.

$$\Delta = (-25)^2 - 4 \cdot 9 \cdot 16 = 49 = 7^2 > 0$$

$$x_1 = \frac{-(-25)-7}{2 \cdot 9} = 1 \quad x_2 = \frac{-(-25)+7}{2 \cdot 9} = \frac{16}{9}$$

$$9x^2 - 25x + 16 = 9\left(x - 1\right)\left(x - \frac{16}{9}\right) = (x - 1)(9x - 16)$$

$$27x^2 - 75x + 48 = 3(9x^2 - 25x + 16) = 3(x - 1)(9x - 16)$$

8) Résolvons l'équation $4x^2 + x - 5 = 0$.

$$\Delta = 1^2 - 4 \cdot 4 \cdot (-5) = 81 = 9^2 > 0$$

$$x_1 = \frac{-1-9}{2 \cdot 4} = -\frac{5}{4} \quad x_2 = \frac{-1+9}{2 \cdot 4} = 1$$

$$4x^2 + x - 5 = 4\left(x + \frac{5}{4}\right)(x - 1) = (4x + 5)(x - 1)$$

9) Résolvons l'équation $11x^2 + 28x - 15 = 0$.

$$\Delta = 28^2 - 4 \cdot 11 \cdot (-15) = 1444 = 38^2$$

$$x_1 = \frac{-28-38}{2 \cdot 11} = -3 \quad x_2 = \frac{-28+38}{2 \cdot 11} = \frac{5}{11}$$

$$11x^2 + 28x - 15 = 11\left(x + 3\right)\left(x - \frac{5}{11}\right) = (x + 3)(11x - 5)$$

10) $x^6 + 7x^3 + 12 = (x^3 + 3)(x^3 + 4)$

11) $x^4 - 3x^2 - 4 = (x^2 + 1)(x^2 - 4) = (x^2 + 1)(x + 2)(x - 2)$

12) $x^5 - 5x^3 + 4x = x(x^4 - 5x^2 + 4) = x(x^2 - 1)(x^2 - 4) =$
 $x(x + 1)(x - 1)(x + 2)(x - 2)$