

Correction du devoir de mathématiques

Exercice 1

$$x = \frac{(3^2)^2 2^7}{3^5 2^6} = 3^4 2^7 3^{-5} 2^{-6} = 3^{-1} 2^1 = \frac{2}{3} ; \quad y = \frac{3^4 2^3 5^{-2}}{2^4 3^4 2^{-3} 5^{-3}} = 2^2 3^0 5^1 = 20$$

Exercice 2 $A = (a^{-3}b^4)^3$ et $B = a^3b^{-2}$, alors

$$\bullet A = a^{-3 \times 3} b^{4 \times 3} = a^{-9} b^{12} \quad \bullet A \times B = a^{-9} b^{12} a^3 b^{-2} = a^{-6} b^{10} \quad \bullet \frac{A}{B} = \frac{a^{-9} b^{12}}{a^3 b^{-2}} = a^{-12} b^{14}$$

Exercice 3 $A = (2x - 5)^2 - 16 = ((2x - 5) - 4) \times ((2x - 5) + 4) = (2x - 9)(2x - 1)$
 $B = (5x - 3)(7x + 4) - (5x - 3) = (5x - 3)((7x + 4) - 1) = (5x - 3)(7x + 3)$

Exercice 4 $(E_1) : 5x - 4 = 2x + 2 \iff 3x = 6 \iff x = 2$

$$(E_2) : \frac{7}{2}x + 1 = 2x + 3$$

$$\iff \frac{7}{2}x - 2x = \frac{3}{2}x = 2$$

$$\iff x = \frac{2}{\frac{3}{2}} = 2 \times \frac{2}{3} = \frac{4}{3}$$

$$(E_3) : x\sqrt{3} - 3 = \frac{12}{3} = 4 \iff x = \frac{7}{\sqrt{3}}$$

Exercice 5

1. a) $f(x) = 10x - 2x^2 - 15 + 3x - 5x + x^2 = -x^2 + 8x - 15$

b) $f(x) = (5 - x)((2x - 3) - x) = (5 - x)(x - 3)$.

2. a) $f(x) = -15 \iff -x^2 + 8x - 15 = -15 \iff -x^2 + 8x = 0 \iff x(-x + 8) = 0$.

Les solutions sont donc : $\mathcal{S} = \{0; 8\}$.

b) $f(x) = 0 \iff (5 - x)(x - 3) = 0$.

Les solutions sont donc $\mathcal{S} = \{3; 5\}$.