

Exercice 45

(4)

Les droites (BC) et (DE) sont parallèles, on peut donc appliquer le Théorème de Thalès.

$$\frac{AB}{AD} = \frac{AC}{AE} = \frac{BC}{DE}$$

on utilise $\frac{AB}{AD} = \frac{AC}{AE} \Leftrightarrow \frac{3}{3+9} = \frac{x}{x+4} \Leftrightarrow \frac{3}{12} = \frac{x}{x+4}$

$$\Leftrightarrow 3(x+4) = 12x \Leftrightarrow 3x + 12 = 12x \Leftrightarrow 9x = 12 \Leftrightarrow x = \frac{12}{9} = \frac{4}{3}$$

Exercice 76

$$A = (x+12)^2 = x^2 + 2 \times 12 \times x + 12^2 = x^2 + 24x + 144$$

$$B = (x+6)(x-6) = x^2 - 6^2 = x^2 - 36$$

$$C = (3x-2)^2 = (3x)^2 - (2+2+3x) + (-2)^2 = 9x^2 - 12x + 4$$

$$D = (9+2x)(9-2x) = 9^2 - (2x)^2 = 81 - 4x^2 = -4x^2 + 81$$

$$E = (5-4x)^2 = 5^2 - (2+4x+5) + (-4x)^2 = 25 - 40x + 16x^2 = 16x^2 - 40x + 25$$

$$F = (5x+8)^2 = (5x)^2 + (2+5x+8) + 8^2 = 25x^2 + 80x + 64$$

Exercice 77

$$A = (x + \frac{2}{3})^2 = x^2 + (2 \times x \times \frac{2}{3}) + (\frac{2}{3})^2 = x^2 + \frac{4}{3}x + (\frac{4}{9})$$

$$B = (x + \frac{5}{4})(x - \frac{5}{4}) = x^2 - (\frac{5}{4})^2 = x^2 - (\frac{25}{16})$$

$$C = (\frac{5}{2} - \frac{1}{2}x)^2 = (\frac{5}{2})^2 - (2 \times \frac{5}{2} \times \frac{1}{2}x) + (-\frac{1}{2}x)^2 = \frac{25}{4} - \frac{5}{2}x + \frac{x^2}{4}$$
$$= \frac{x^2}{4} - \frac{5}{2}x + \frac{25}{4}$$

Exercice 107

$$A = -4(x-3)^2 = -4(x^2 - 6x + 9) = -4x^2 + 24x - 36$$

$$B = (x+1)(x-2)(x+3) = (x+1)(x^2 + 3x - 2x - 6) = (x+1)(x^2 + x - 6)$$

$$B = (x+1)(x^2+x-6) = x^3+x^2-6x+x^2+x-6$$

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

$$C = (3-x)(x+5)^2 = (3-x)(x^2+10x+25)$$

$$= 3x^2+30x+75-x^3-10x^2-25x$$

$$= -x^3-7x^2+5x+75$$

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