Calcul algébrique

Correction de l'exercice 1

1.

$$\begin{aligned} A &= \sqrt{27} - 2\sqrt{3} \\ &= \sqrt{3^2 \times 3} - 2\sqrt{3} \\ &= 3\sqrt{3} - 2\sqrt{3} \\ &= \sqrt{3} \end{aligned}$$

2.

$$\begin{aligned} B &= \sqrt{6} + \sqrt{24} \\ B &= \sqrt{6} + \sqrt{2^2 \times 6} \\ &= \sqrt{6} + 2\sqrt{6} \\ &= 3\sqrt{6} \end{aligned}$$

3.

$$\begin{aligned} C &= \sqrt{243} - 5\sqrt{27} \\ &= \sqrt{3^4 \times 3} - 5\sqrt{3^2 \times 3} \\ &= 3^2\sqrt{3} - 5 \times 3\sqrt{3} \end{aligned}$$

Correction de l'exercice 2

1.

$$\begin{aligned} A &= \left(\sqrt{20} - 5\sqrt{5}\right)^2 \\ &= \left(\sqrt{2^2 \times 5} - 5\sqrt{5}\right)^2 \\ &= \left(2\sqrt{5} - 5\sqrt{5}\right)^2 \\ &= \left(-3\sqrt{5}\right)^2 \\ &= (-3)^2 \times \left(\sqrt{5}\right)^2 \\ &= 9 \times 5 \\ &= 45 \end{aligned}$$

2.

$$\begin{aligned} B &= \left(\sqrt{2} - \sqrt{5}\right)^2 \\ &= \left(\sqrt{2}\right)^2 - 2\sqrt{2}\sqrt{5} + \left(\sqrt{5}\right)^2 \\ &= 2 - 2\sqrt{10} + 5 \\ &= 7 - 2\sqrt{10} \end{aligned}$$

3.

$$\begin{aligned} C &= \left(\sqrt{3} + \sqrt{2}\right)^2 \\ &= 3 + 2\sqrt{3}\sqrt{2} + 2 \\ &= 5 + 2\sqrt{6} \end{aligned}$$

Correction de l'exercice 3

1.

$$\begin{aligned} A &= \sqrt{40} + 3\sqrt{2}\sqrt{5} \\ &= \sqrt{2^2 \times 10} + 3\sqrt{10} \\ &= 2\sqrt{10} + 3\sqrt{10} \\ &= 5\sqrt{10} \end{aligned}$$

2.

$$\begin{aligned} B &= \sqrt{2} + \sqrt{4} + \sqrt{8} \\ &= \sqrt{2} + 2 + \sqrt{2^2 \times 2} \\ &= \sqrt{2} + 2 + 2\sqrt{2} \\ &= 3\sqrt{2} + 2 \end{aligned}$$

3.

$$\begin{aligned} C &= \sqrt{75} - 3\sqrt{147} \\ &= \sqrt{3 \times 5^2} - 3\sqrt{3 \times 7^2} \\ &= 5\sqrt{3} - 3 \times 7\sqrt{3} \\ &= 5\sqrt{3} - 21\sqrt{3} \\ &= -16\sqrt{3} \end{aligned}$$