

p. 15, Exercise 3.

$$1. \quad 2\sqrt{5} - 3\sqrt{5} + 4\sqrt{5}$$
$$= \underline{3\sqrt{5}}$$

$$2. \quad 1 \cdot \sqrt[3]{2} + 5 \cdot \sqrt[3]{2} - 2 \sqrt[3]{2}$$
$$= \underline{4 \cdot \sqrt[3]{2}}$$

$$4. \quad 3\sqrt{2} + 10\sqrt{3} - 7\sqrt{2} + 4\sqrt{3}$$
$$= \underline{-4\sqrt{2} + 14\sqrt{3}}$$

$$7. \quad \sqrt[3]{24} - \sqrt[3]{81} + \sqrt[3]{192}$$
$$= \sqrt[3]{8 \times 3} - \sqrt[3]{27 \times 3} + \sqrt[3]{64 \times 3}$$
$$= 2 \cdot \sqrt[3]{3} - 3 \sqrt[3]{3} + 4 \sqrt[3]{3}$$
$$= \underline{3 \cdot \sqrt[3]{3}}$$

$$\sqrt[3]{19^2}$$

$$9. \quad \frac{\sqrt{108} - \sqrt{27}}{\sqrt{12}}$$

$$= \frac{6\sqrt{3} - 3\sqrt{3}}{2\sqrt{3}}$$

$$= \frac{3\sqrt{3}}{2\sqrt{3}}$$

$$\begin{aligned} & 108 \\ &= 12 \times 9 \\ &= 4 \times 3 \times 9 \\ &= 36 \times 3 \end{aligned}$$

$$= \frac{5}{2},$$

$$\begin{aligned} 12. \quad & \sqrt[6]{\sqrt{2}} - \sqrt[12]{2^{24}} \\ &= \left( (2)^{\frac{1}{2}} \right)^{\frac{1}{6}} - \left( 2^{24} \right)^{\frac{1}{12}} \\ &= 2^{\frac{1}{12}} - \left( 2^{24} \right)^{\frac{1}{12}} \\ &= 2^{\frac{1}{12}} - 2^2 \\ &= \sqrt[12]{2} - 4. \end{aligned}$$

$\longrightarrow$

$$\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$$

Rationalise denominator:

$$\frac{(\sqrt{3} - \sqrt{2})}{(\sqrt{3} + \sqrt{2})} \cdot \frac{(\sqrt{3} - \sqrt{2})}{(\sqrt{3} - \sqrt{2})}$$

$$= \frac{3 - 2\sqrt{6} + 2}{3 - 2}$$

$$= 2\sqrt{6}$$

$$= \frac{5 - 2\sqrt{5}}{1}$$

$$\frac{2}{\sqrt{5} + 1} \cdot \frac{(\sqrt{5} - 1)}{(\sqrt{5} - 1)}$$

$$= \frac{2(\sqrt{5} - 1)}{5 - 1}$$

$$= \frac{2^{\cancel{2}}(\sqrt{5} - 1)}{4^{\cancel{2}}}$$

$$= \frac{(\sqrt{5} - 1)}{2}$$

