

Surds Solutions

Exercise A

$$\begin{aligned} 1. \sqrt{12} \\ &= \sqrt{4 \times 3} \\ &= \sqrt{4} \times \sqrt{3} \\ &= \underline{\underline{2\sqrt{3}}} \end{aligned}$$

$$\begin{aligned} 2. \sqrt{75} \\ &= \sqrt{25 \times 3} \\ &= \sqrt{25} \times \sqrt{3} \\ &= \underline{\underline{5\sqrt{3}}} \end{aligned}$$

$$\begin{aligned} 3. \sqrt{28} \\ &= \sqrt{4 \times 7} \\ &= \sqrt{4} \times \sqrt{7} \\ &= \underline{\underline{2\sqrt{7}}} \end{aligned}$$

$$\begin{aligned} 4. \sqrt{160} \\ &= \sqrt{16 \times 10} \\ &= \sqrt{16} \times \sqrt{10} \\ &= \underline{\underline{4\sqrt{10}}} \end{aligned}$$

Exercise B

$$\begin{aligned} 1. \sqrt{3} \times \sqrt{2} \\ &= \underline{\underline{\sqrt{6}}} \end{aligned}$$

$$\begin{aligned} 2. \frac{\sqrt{24}}{\sqrt{8}} &= \sqrt{\frac{24}{8}} \\ &= \underline{\underline{\sqrt{3}}} \end{aligned}$$

$$\begin{aligned} 3. 2\sqrt{18} \times 3\sqrt{2} \\ &2 \times \sqrt{18} \times 3 \times \sqrt{2} \\ &3 \times 2 \times \sqrt{18} \times \sqrt{2} \\ &6 \times \sqrt{36} \\ &6 \times 6 \\ &= \underline{\underline{36}} \end{aligned}$$

$$4. \frac{4\sqrt{33}}{2\sqrt{3}} = \frac{2\sqrt{33}}{\sqrt{3}} \quad \underline{\underline{2\sqrt{11}}}$$

Exercise C.

$$1. \sqrt{3}(2-\sqrt{3})$$

$$= 2\sqrt{3} - \sqrt{9}$$

$$= \underline{\underline{2\sqrt{3} - 3}}$$

$$2. 3\sqrt{2}(4-2\sqrt{2})$$

$$= 12\sqrt{2} - 6 \times \sqrt{4}$$

$$= \underline{\underline{12\sqrt{2} - 12}}$$

$$3. (1+\sqrt{3})(3-\sqrt{3})$$

$$= \cancel{3} - \sqrt{3} + 3\sqrt{3} - \cancel{3}$$

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

$$4. (1+\sqrt{3})(1+\sqrt{3})$$

$$= 1 + \sqrt{3} + \sqrt{3} + 3$$

$$= \underline{\underline{2\sqrt{3} + 4}}$$

Exercise D.

$$1. \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \underline{\underline{\frac{\sqrt{3}}{3}}}$$

$$2. \frac{2}{3\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \underline{\underline{\frac{2\sqrt{5}}{3 \times 5}}}$$

$$= \frac{2\sqrt{5}}{15}$$

$$= \underline{\underline{\frac{2\sqrt{5}}{15}}}$$

$$3. \frac{(2-\sqrt{3})}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

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

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

$$\rightarrow \frac{\sqrt{3}(2-\sqrt{3})}{3}$$

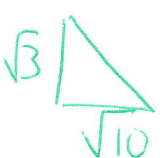
$$4 \frac{(2-\sqrt{5})}{(\sqrt{5}+1)} \times \frac{(\sqrt{5}-1)}{(\sqrt{5}-1)}$$

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

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

$$= \frac{3\sqrt{5} - 7}{4}$$

$$= \frac{3\sqrt{5} - 7}{4}$$

1.  By Pyth.
 $?^2 = (\sqrt{3})^2 + (\sqrt{10})^2$
 $?^2 = 3 + 10$
 $? = \underline{\underline{\sqrt{13}}}$

2. By Pyth.
 $(\sqrt{22})^2 = (\sqrt{8})^2 + ?^2$
 $?^2 = 22 - 8$
 $?^2 = 14$
 $? = \underline{\underline{\sqrt{14}}}$

3. By Pyth.
 $(\sqrt{15})^2 = (\sqrt{11})^2 - ?^2$
 $?^2 = 15 - 11$
 $?^2 = 4$
 $? = \sqrt{4}$
 $= 2 //$

4. By Pythagoras.

$$(\sqrt{2} + \sqrt{10})^2 = (\sqrt{3})^2 + (2 + \sqrt{5})^2$$

$$\begin{array}{ccccccc} \downarrow & & \downarrow & & \downarrow & & \\ 2 + \sqrt{20} + \sqrt{20} + 10 & = & 3 + & 4 + 2\sqrt{5} + 2\sqrt{5} + 5 \end{array}$$

$$12 + 2\sqrt{20} = 3 + 4 + 5 + 4\sqrt{5}$$

$$12 + 2\sqrt{20} = 12 + 4\sqrt{5}$$

$$12 + 2\sqrt{4 \times 5} = 12 + 4\sqrt{5}$$

$$12 + 2 \times \sqrt{4} \times \sqrt{5} = 12 + 4\sqrt{5}$$

$$12 + 4\sqrt{5} = 12 + 4\sqrt{5}$$

$$\text{LHS} = \text{RHS}$$

∴ Proven and
the triangle
is right
angled.