Surds Solutions

Exercise A

1. $\sqrt{12}$
$= \sqrt{4 \times 3}$
$= \sqrt{4} \times \sqrt{3}$
$= 2\sqrt{3}$

2. $\sqrt{75}$
$= \sqrt{25 \times 3}$
$= \sqrt{25} \times \sqrt{3}$
$= 5\sqrt{3}$

3. $\sqrt{28}$
$= \sqrt{\ \times 7}$
$= \sqrt{4} \times \sqrt{7}$
$= 2\sqrt{7}$

4. $\sqrt{160}$
$= \sqrt{16 \times 10}$
$= \sqrt{16} \times \sqrt{10}$
$= 4\sqrt{10}$

Exercise B

1. $\sqrt{3} \times \sqrt{2}$
$= \sqrt{6}$

2. $\frac{\sqrt{24}}{\sqrt{8}} = \sqrt{\frac{24}{8}}$
$= \sqrt{3}$

3. $2\sqrt{18} \times 3\sqrt{2}$
$2 \times \sqrt{18} \times 3 \times \sqrt{2}$
$3 \times 2 \times \sqrt{18} \times \sqrt{2}$
$6 \times \sqrt{36}$
6×6
$= 36$

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

Exercise C.

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

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

$= 2\sqrt{3} - 3$

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

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

$= 12\sqrt{2} - 12$

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

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

$= 2\sqrt{3}$

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

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

$= 2\sqrt{3} + 4$

Exercise D.

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

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

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

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

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

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

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

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

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

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

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

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By pyth.

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

$?^2 = 3+10$

$? = \sqrt{13}$

2. By Pyth.

$(\sqrt{22})^2 = (\sqrt{8})^2 + ?^2$

$?^2 = 22-8$

$?^2 = 14$

$? = \sqrt{14}$

3. By Pyth.

$(\sqrt{15})^2 = (\sqrt{11})^2 - ?^2$

$?^2 = 15-11$

$?^2 = 4$

$? = \sqrt{4}$

$= 2$ //

4. By Pythagoras.

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

$$2+\sqrt{20}+\sqrt{20}+10 = 3 + 4+2\sqrt{5}+2\sqrt{5}+5$$

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

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

$$12+2\sqrt{4\times5} = 12+4\sqrt{5}$$

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

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

LHS = RHS

∴ Proven and the triangle is right angled.