

Surds - Section Test

(Answers)

1.

$$\sqrt{50} = \sqrt{25 \times 2} = \sqrt{25} \times \sqrt{2} = 5\sqrt{2}$$

2.

$$\sqrt{6} \times \sqrt{54} = \sqrt{6} \times \sqrt{6 \times 9} = \sqrt{6} \times \sqrt{6} \times \sqrt{9} = 6 \times 3 = 18$$

3.

$$\sqrt{72} = \sqrt{36 \times 2} = \sqrt{36} \times \sqrt{2} = 6\sqrt{2}$$

4.

$$\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{2}}{2} = \frac{1}{2}\sqrt{2}$$

5.

$$\sqrt{18} - \sqrt{8} = \sqrt{9 \times 2} - \sqrt{4 \times 2} = 3\sqrt{2} - 2\sqrt{2} = \sqrt{2}$$

6.

$$\begin{aligned} (\sqrt{11} - 2)(\sqrt{11} + 2) &= (\sqrt{11})^2 + 2\sqrt{11} - 2\sqrt{11} - 2^2 \\ &= 11 - 4 \\ &= 7 \end{aligned}$$

7.

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

8.

$$\begin{aligned} 2(\sqrt{3} - \sqrt{2}) + 3(2\sqrt{2} - \sqrt{3}) &= 2\sqrt{3} - 2\sqrt{2} + 6\sqrt{2} - 3\sqrt{3} \\ &= 4\sqrt{2} - \sqrt{3} \end{aligned}$$

9.

$$\begin{aligned} (2\sqrt{2} + 5)^2 &= (2\sqrt{2})^2 + 2 \times 5 \times 2\sqrt{2} + 5^2 \\ &= 4 \times 2 + 20\sqrt{2} + 25 \\ &= 33 + 20\sqrt{2} \end{aligned}$$

10.

$$\begin{aligned} (\sqrt{5} + 2\sqrt{7})^2 + (\sqrt{5} - 2\sqrt{7})^2 &= (\sqrt{5})^2 + 2 \times \sqrt{5} \times 2\sqrt{7} + (2\sqrt{7})^2 \\ &\quad + (\sqrt{5})^2 - 2 \times \sqrt{5} \times 2\sqrt{7} + (2\sqrt{7})^2 \\ &= 5 + 4\sqrt{5}\sqrt{7} + 4 \times 7 + 5 - 4\sqrt{5}\sqrt{7} + 4 \times 7 \\ &= 5 + 28 + 5 + 28 \\ &= 66 \end{aligned}$$