

## surds

$${}^n\sqrt{x} = y \qquad {}^5\sqrt{32} = 2$$

$$y^n = x \qquad 2^5 = 32$$

$$(\sqrt{x})^2 = x$$

$$\sqrt{x^2} = x$$

$$\sqrt{xy} = \sqrt{x} \times \sqrt{y}$$

## surds (adding and subtracting surds)

**Q) Simplify the following**

$$\begin{aligned} \text{a) } & \sqrt{8} + \sqrt{2} \\ & = \sqrt{4 \times 2} + \sqrt{2} \\ & = 2\sqrt{2} + \sqrt{2} \\ & = 3\sqrt{2} \end{aligned}$$

$$\begin{aligned} \text{b) } & \sqrt{27} + \sqrt{3} \\ & = \sqrt{9 \times 3} + \sqrt{3} \\ & = 3\sqrt{3} + \sqrt{3} \\ & = 4\sqrt{3} \end{aligned}$$

## multiplying surds

$$\begin{aligned} \text{a) } & \sqrt{5} \times \sqrt{17} \\ & = \sqrt{85} \end{aligned}$$

$$\begin{aligned} \text{b) } & 3\sqrt{7} \times 2\sqrt{5} \\ & = 3 \times 2\sqrt{7 \times 5} \\ & = 6\sqrt{35} \end{aligned}$$

$$\begin{aligned} \text{c) } & -\sqrt{6} \times -\sqrt{11} \\ & = -1 \times -1 \times \sqrt{6 \times 11} \\ & = +1\sqrt{66} \end{aligned}$$

## dividing surds

$$a) \sqrt{33} \div \sqrt{11}$$

$$= \sqrt{\frac{33}{11}}$$

$$= \sqrt{3}$$

$$b) -\sqrt{20} \div \sqrt{2}$$

$$= -\sqrt{\frac{20}{2}}$$

$$= -\sqrt{10}$$

$$c) -\frac{\sqrt{50}}{\sqrt{10}}$$

$$= -\sqrt{\frac{50}{10}}$$

$$= -\sqrt{5}$$

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