

## 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

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

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

## multiplying surds

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

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

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

## dividing surds

$$\begin{aligned} a) & \sqrt{33} \div \sqrt{11} \\ &= \sqrt{\frac{33}{11}} \\ &= \sqrt{3} \end{aligned}$$

$$\begin{aligned} b) & -\sqrt{20} \div \sqrt{2} \\ &= -\sqrt{\frac{20}{2}} \\ &= -\sqrt{10} \end{aligned}$$

$$\begin{aligned} c) & -\frac{\sqrt{50}}{\sqrt{10}} \\ &= -\sqrt{\frac{50}{10}} \\ &= -\sqrt{5} \end{aligned}$$

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