

INDICES

$$x^{a+b} = x^a x^b$$

$$x^{ab} = (x^a)^b$$

$$x^{a-b} = \frac{x^a}{x^b}$$

$$x^{-n} = \frac{1}{x^n}$$

$$x^{\frac{1}{n}} = \sqrt[n]{x}$$

SURDS

$$\sqrt{ab} = \sqrt{a}\sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\frac{1}{a\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \dots$$

$$\frac{1}{a+\sqrt{b}} \times \frac{a-\sqrt{b}}{a-\sqrt{b}} = \dots$$

FRACTIONS

$$\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$$

$$\frac{a}{bx^n} = \left(\frac{a}{b}\right)\left(\frac{1}{x^n}\right)$$



Write $\frac{4\sqrt{x}-1}{3\sqrt{2}x^2}$ in the form $\alpha x^n + \beta x^m$

$$\begin{aligned} \frac{4\sqrt{x}-1}{3\sqrt{2}x^2} &= \frac{4\sqrt{x}}{3\sqrt{2}x^2} - \frac{1}{3\sqrt{2}x^2} \\ &= \left(\frac{4}{3\sqrt{2}}\right)\left(\frac{\sqrt{x}}{x^2}\right) - \left(\frac{1}{3\sqrt{2}}\right)\left(\frac{1}{x^2}\right) \\ &= \frac{4}{3\sqrt{2}}x^{\frac{1}{2}-2} - \frac{1}{3\sqrt{2}}x^{-2} \\ &= \frac{4\sqrt{2}}{3\sqrt{2}\sqrt{2}}x^{-\frac{3}{2}} - \frac{\sqrt{2}}{3\sqrt{2}\sqrt{2}}x^{-2} \\ &= \frac{4\sqrt{2}}{6}x^{-\frac{3}{2}} - \frac{\sqrt{2}}{6}x^{-2} \\ &= \left(\frac{4}{6}\right)\left(\frac{\sqrt{2}}{1}\right)x^{-\frac{3}{2}} - \left(\frac{1}{6}\right)\left(\frac{\sqrt{2}}{1}\right)x^{-2} \\ &= \frac{2}{3}\sqrt{2}x^{-\frac{3}{2}} - \frac{1}{6}\sqrt{2}x^{-2} \end{aligned}$$

