



Exponents

Can \sqrt{x} be written as x to a power?

Knowing that $(\sqrt{x})^2 = x$ and $(x^p)^q = x^{p \cdot q}$

$$\downarrow$$
$$(x^?)^2 = x^1$$

$$? \cdot 2 = 1$$

$$? = \frac{1}{2}$$

$$\text{So } x^{\frac{1}{2}} = \sqrt{x}$$

Where do the numbers in the fraction come from?

$$\sqrt[2]{x^1}$$

General rule:

$$\sqrt[q]{x^p} = x^{\frac{p}{q}}$$

and

$$x^{\frac{2}{3}} = \sqrt[3]{x^2}$$

$$x^{\frac{1}{5}} = x^{\frac{6}{5}} = \sqrt[5]{x^6}$$

$$x^{\frac{p}{q}} = \sqrt[q]{x^p}$$

$$\sqrt[8]{x^3} = x^{\frac{3}{8}}$$

$$\sqrt[5]{x^4} = x^{\frac{4}{5}}$$

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