Powers

A power is the how many times a something is multiplied by itself

Volume =

\[ m \times m = m^2 \]
\[ m \times m \times m = m^3 \]
\[ m \times m \times m \times m = m^4 \]
\[ 5 \times 5 \times 5 = 5^3 \]
\[ 4^5 = 4 \times 4 \times 4 \times 4 \times 4 = \]

Area = 49m²

\[ \sqrt{\text{square - root}} \]
\[ \sqrt[3]{\text{cube - root}} \]
\[ \sqrt[5]{\text{fifth - root}} \]

Side length =
(answers to 4sf if needed)

1) \[ \sqrt{81} = \]
2) \[ \sqrt{56} = \]
3) \[ \sqrt[3]{520} = \]
4) \[ \sqrt[3]{-84} = \]
5) \[ \sqrt[3]{0.00468} = \]

\[ \sqrt{25} \text{ means } ? \times ? = 25 \text{ so } ? = 5 \]

Calculator use

\[ x^2 \quad \sqrt{} \quad x^3 \quad \sqrt[3]{} \quad x^y \quad \hat{\quad} \quad \sqrt[3]{} \quad \]
Powers (extension)

(Round to 4sf where needed)

1) \( \frac{5}{3} \times \frac{5}{3} = \left( \frac{5}{3} \right)^5 = \frac{5}{3} \times \\frac{5}{3} \)

2) \( 8^3 = \left( \sqrt[3]{8} \right)^4 = \sqrt[3]{8^4} = \)

3) \( \left( \sqrt[4]{9} \right)^7 = \sqrt[4]{9^7} = \)

4) \( 6.4^{\frac{5}{3}} = \)

5) \( 135 \times \frac{5}{3} = \)

6) \( (6^4 - 5^3)^{\frac{2}{5}} = \)

Hint: When calculating fractional powers put the power in brackets

Reciprocal

How many times a number (n) can be divided into 1 is the reciprocal of that number.

eg The reciprocal of \( \frac{1}{2} \) is 2.

The reciprocal of 4 is \( \frac{1}{4} \)

The reciprocal of ‘n’ is \( \frac{1}{n} \) or \( 1 \div n \)

Note: for fractions just invert the fraction. eg Reciprocal of \( \frac{5}{9} \) is \( \frac{9}{5} \) (or \( 1 \frac{4}{5} \))

Find the reciprocals of

1) \( \frac{9}{14} \)

2) \( -3 \frac{7}{11} \)

3) 0.005

4) 416.6