

Cube Roots

1. A cube has a volume of 27 in^3 . What is the measure of one of its sides? Write and solve an equation.

2. What value of x makes the following equation true: $x^3 = 64$?

3. Find the value of x that makes the equation true: $x^3 = 343^{-1}$.

Cube Roots

1. A cube has a volume of 27 in^3 . What is the measure of one of its sides? Write and solve an equation.

$$\begin{aligned}27 &= x^3 \\ \sqrt[3]{27} &= \sqrt[3]{x^3} \\ \sqrt[3]{27} &= x \\ 3 &= x\end{aligned}$$

Check:

$$\begin{aligned}27 &= 3^3 \\ 27 &= 27\end{aligned}$$

The cube has side lengths of 3 in.

2. What value of x makes the following equation true: $x^3 = 64$?

$$\begin{aligned}x^3 &= 64 \\ \sqrt[3]{x^3} &= \sqrt[3]{64} \\ x &= \sqrt[3]{64} \\ x &= 4\end{aligned}$$

Check:

$$\begin{aligned}4^3 &= 64 \\ 64 &= 64\end{aligned}$$

3. Find the value of x that makes the equation true: $x^3 = 343^{-1}$.

$$\begin{aligned}x^3 &= 343^{-1} \\ \sqrt[3]{x^3} &= \sqrt[3]{343^{-1}} \\ x &= \sqrt[3]{343^{-1}} \\ x &= \sqrt[3]{\frac{1}{343}} \\ x &= \frac{1}{7} \\ x &= 7^{-1}\end{aligned}$$

Check:

$$\begin{aligned}(7^{-1})^3 &= 343^{-1} \\ 7^{-3} &= 343^{-1} \\ \frac{1}{7^3} &= 343^{-1} \\ \frac{1}{343} &= 343^{-1} \\ 343^{-1} &= 343^{-1}\end{aligned}$$