

Squares, Cubes and Roots

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* Squaring a number means to multiply by ITSELF.

↳ The symbol for squaring is a tiny 2

Ex. $3^2 = 3 \times 3 = 9$

$(-8)^2 = (-8) \times (-8) = 64$

↑
Exponential
Form

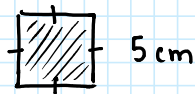
↑
Expanded
Form

↑
Evaluated

calculator



* You can picture "squaring" using a square:



5 cm

$5^2 = 5 \times 5 = 25 \text{ cm}^2$
↑
side length
↖ Area

Ex. Evaluate: a) $16^2 = 256$

b) $1.7^2 = 2.89$

c) $(-11)^2 = 121$

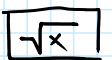
* Perfect squares are a special set of numbers, created by squaring whole numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, ...

Square Roots

• Finding a square root is the opposite of squaring

↳ You identify 2 identical factors.

↳ The symbol for a square root: $\sqrt{\quad}$



Ex. calculate the square root a) $\sqrt{225} = 15$

b) $\sqrt{1600} = 40$

c) $\sqrt{1.96} = 1.4$

Cube + cube Roots

* Cubing a number is multiplying by ITSELF TWICE, 3 identical factors.

↳ The symbol for cubing is a tiny 3.

Ex. $7^3 = 7 \times 7 \times 7 = 343$

x^3 y^x x^y x^a

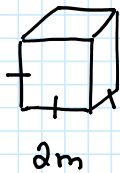
$7 \sqrt[3]{x^y} = 343$

x^a \wedge

$13^3 = 13 \times 13 \times 13 = 2197$

$(-9)^3 = (-9) \times (-9) \times (-9) = -729$

* You can picture "cubing" with a cube:



$V = L \times w \times H$

$V = 2 \times 2 \times 2$

$V = 2^3 = 8 \text{ cm}^3$
↑ side length ↑ volume

A cube root is the opposite of cubing:

↳ Find 3 identical factors

↳ The symbol for a cube root $\sqrt[3]{\quad}$

$\sqrt[3]{x^y}$

Ex. Find each root: a) $\sqrt[3]{512} = 8$

b) $\sqrt[3]{1331} = 11$

c) $\sqrt[3]{-512} = -8$

$\sqrt[n]{x}$