MATHEMATICS · GRADES 7-9

# Cube numbers and cube roots

### Difficulty level: Intermediate

### Mathematics: Grades 7-9

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## *Overview of the concept*

This is how you move between the edge of a cube and its volume. If you know how much a storage box holds, you can work out how long each edge must be. If you know the edge, you can work out how much it holds. Builders and packers use this whenever a container has to hold a set amount in a cube shape.




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## Worked examples

EXAMPLE 1

**Q** What is $\sqrt[3]{27}$?

SOLUTION

A cube root asks: what number, multiplied by itself three times, gives 27?

Try 3: $3 \times 3 \times 3 = 27$

So $\sqrt[3]{27} = 3$

EXAMPLE 2

**Q** What is $4^3$?

SOLUTION

Cubed means multiplied by itself three times.

$4 \times 4 \times 4 = 64$

So $4^3 = 64$

## Practice questions

1 A cube has volume 8 cm³. What is the length of each edge?

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**2** A cube has edge 4 cm. What is the area of one face?

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**3** A cube has edge 2 cm. What is its volume?

- **A** 4 $cm^3$
- **B** 6 $cm^3$
- **C** 8 $cm^3$
- **D** 16 $cm^3$

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**4** Which of these is a cube number?

- **A** 25
- **B** 36
- **C** 125
- **D** 50

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**5** A cube has edge 5 cm. What is its surface area?

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**6** A cube has volume 27 cm³. Its edge is doubled. What is the new volume?

- **A** 54 cm³
- **B** 81 cm³
- **C** 216 cm³
- **D** 9 cm³

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**7** How many small cubes of edge 1 cm fit in a cube of edge 2 cm?

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**8** A cube has volume 8 cm³. What is the area of one face?

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**9** A cube has edge 3 cm and another has edge 4 cm. What is the greater volume?

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**10** A fish tank is a cube with volume 216 cm³. How long is each edge, and what is the area of one face?

A. 6 cm; one face is 6 cm².

B. 36 cm; one face is 6 cm².

C. 6 cm; one face is 36 cm².

D. 6 cm; one face is 216 cm².

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## ANSWER KEY

**1.** 2 cm

**2.** 16 $cm^2$

**3.** 8 $cm^3$

**4.** 125

**5.** 150 $cm^2$

**6.** 216 $cm^3$

**7.** 8

**8.** 4 $cm^2$

**9.** 64 $cm^3$

**10.** 6 cm; one face is 36 $cm^2$.

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