MATHEMATICS · GRADES 7-9

Evaluating powers

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you work out a number multiplied by itself several times. The area of a square room is its side multiplied by itself, and the volume of a cube-shaped box is its side multiplied by itself twice. Powers turn repeated multiplication into a short piece of writing. They show up everywhere, from floor areas to compound interest.



Rule

Power: a^n means the base a multiplied by itself n times, where n is the exponent.

So $2^3 = 2 \times 2 \times 2 = 8$.

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Worked examples

EXAMPLE 1

Q Evaluate $(-2)^3$.

SOLUTION

This is a power with a negative base, so the sign matters: an odd exponent keeps the minus, an even exponent loses it.

$(-2)^3$ means $(-2) \times (-2) \times (-2)$

That is -8

EXAMPLE 2

Q Evaluate 4^2.

SOLUTION

4^2 means the base 4 multiplied by itself 2 times.

$4 \times 4 = 16$

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Practice questions

1 What is 6^2?

- A 12 square metres
- B 36 square metres
- C 18 square metres
- D 24 square metres

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2 What is 3^3?

- A 9 cubic centimetres
- B 18 cubic centimetres
- C 27 cubic centimetres
- D 81 cubic centimetres

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3 **What is $(-3)^2$?**

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4 **What is $(-2)^5$?**

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5 **What is 2^6?**

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6 **What is 1^{10}?**

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7 **What is 0^{5}?**

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8 **What is 10^{3}?**

A 30 cubic metres

B 100 cubic metres

C 1000 cubic metres

D 3000 cubic metres

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9 What is $(-1)^4$?

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10 What is 5^0?

A 0

B 1

C 5

D 25

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ANSWER KEY

1. 36 square metres

2. 27 cubic centimetres

3. 9

4. –32

5. 64

6. 1

7. 0

8. 1000 cubic metres

9. 1

10. 1

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