CLASS 8 MATHS NCERT SOLUTIONS

NCERT Solutions for Class 8 Maths Chapter 1: A Square and A Cube – Free PDF Download

Chapter 1 — A Square and A Cube — is the opening chapter of the new Ganita Prakash Part 1 (Grade 8) textbook. It introduces square numbers and cube numbers, digit and zero patterns, the sum-of-consecutive-odd-numbers pattern, and how to find square roots and cube roots using prime factorisation. The chapter has ...

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NCERT Solutions for Class 8 Maths Chapter 1: A Square and A Cube

Figure It Out — Square Numbers (Section 1.1)

1. Which of the following numbers are not perfect squares? (i) 2032 (ii) 2048 (iii) 1027 (iv) 1089
(i), (ii) and (iii) are **not** perfect squares — each ends in 2, 8 or 7, digits that a perfect square can never end in. (iv) $1089 = 33^2$, so it **is** a perfect square.

2. Which one among 64^2, 108^2, 292^2, 36^2 has last digit 4?
$108^2 = 11664$ and $292^2 = 85264$ both end in 4. (64^2=4096 and 36^2=1296 end in 6.)

3. Given $125^2 = 15625$, what is the value of 126^2? (i) 15625+126 (ii) 15625+262 (iii) 15625+253 (iv) 15625+251 (v) 15625+512
(iv) 15625+251, since $126^2 = (125+1)^2 = 125^2 + 2\times125 + 1 = 15625 + 250 + 1 = 15625 + 251$.

4. Find the length of the side of a square whose area is 441 m^2.
$441 = 3^2\times7^2$, so $\sqrt{441} = 21$. The side is **21 m**.

5. Find the smallest square number that is divisible by each of 4, 9 and 10.
LCM(4,9,10) = $180 = 2^2\times3^2\times5$. The lone 5 needs a partner, so multiply by 5: 180×5 = **900** ($=30^2$).

6. Find the smallest number by which 9408 must be multiplied so that the product is a perfect square. Find the square root of the product.
$9408 = 2^2\times3\times7^2$ needs one more 3, so multiply by **3**. The product is 28224, and $\sqrt{28224} = 2^3\times3\times7$ = **168**.

7. How many numbers lie between the squares of (i) 16 and 17 (ii) 99 and 100?
Between n^2 and $(n+1)^2$ there are always 2n numbers. (i) 2×16 = **32** numbers. (ii) 2×99 = **198** numbers.

8. Fill in the missing numbers in the pattern: $1^2+2^2+2^2=3^2$; $2^2+3^2+6^2=7^2$; $3^2+4^2+12^2=13^2$; $4^2+5^2+20^2=(\ )^2$; $9^2+10^2+(\ )^2=(\ )^2$
Pattern: for a row starting at n, the third term is n(n+1) and the result is n(n+1)+1. So $4^2+5^2+20^2$ = $\mathbf{21^2}$, and $9^2+10^2+\mathbf{90}^2 = \mathbf{91}^2$ ($9\times10=90$, 90+1=91).

9. How many tiny squares are in the picture, and what is the prime factorisation of that number?
81 big squares (9×9), each split into 25 tiny squares, gives 81×25 = **2025** tiny squares. Prime factorisation: 2025 = $\mathbf{3^4\times5^2}$ ($=45^2$).

Figure It Out — Cubic Numbers (Section 1.2)

1. Find the cube roots of 27000 and 10648.
$27000 = 2^3\times3^3\times5^3 = 30^3$, so $\sqrt[3]{27000}$ = **30**. $10648 = 2^3\times11^3 = 22^3$, so $\sqrt[3]{10648}$ = **22**.

2. What number will you multiply by 1323 to make it a cube number?
$1323 = 3^3\times7^2$, needing one more 7, so multiply by **7** (gives $3^3\times7^3 = 9261 = 21^3$).

3. State true or false. Explain your reasoning.
(i) The cube of any odd number is even.
(ii) There is no perfect cube that ends with 8.
(iii) The cube of a 2-digit number may be a 3-digit number.
(iv) The cube of a 2-digit number may have seven or more digits.
(v) Cube numbers have an odd number of factors.
All five statements are **False**. (i) odd×odd×odd = odd (e.g. 3^3=27). (ii) numbers ending in 2 cube to numbers ending in 8 (e.g. 12^3=1728). (iii) the smallest 2-digit number, 10, already gives 10^3=1000 — 4 digits, never 3. (iv) the largest 2-digit number, 99, gives 99^3=970299 — only 6 digits, never 7 or more. (v) e.g. 8=2^3 has factors {1,2,4,8} — 4 factors, an even count; only perfect squares among cubes (6th powers) have an odd factor count, so the general claim is false.

4. You are told 1331 is a perfect cube. Guess its cube root without factorisation. Do the same for 4913, 12167 and 32768.
Using the last-digit rule and bracketing between known cubes: $\sqrt[3]{1331}$ = **11**, $\sqrt[3]{4913}$ = **17**, $\sqrt[3]{12167}$ = **23**, $\sqrt[3]{32768}$ = **32**.

5. Which of the following is the greatest? (i) $67^3–66^3$ (ii) $43^3–42^3$ (iii) $67^2–66^2$ (iv) $43^2–42^2$
(i) $67^3–66^3$ = 13267 is the **greatest** ($43^3–42^3$=5419; $67^2–66^2$=133; $43^2–42^2$=85). Cube differences of consecutive numbers grow much faster than square differences.

Try These & Math Talk (In-text Questions)

Which locker numbers stay open in the 100-lockers puzzle?
Exactly the perfect squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100 — because only a square number has an odd number of factors (one factor pairs with itself).

Which of 38^2, 34^2, 46^2, 56^2, 74^2, 82^2 end in digit 6?
34^2=1156, 46^2=2116, 56^2=3136, 74^2=5476 all end in 6 (38^2=1444 and 82^2=6724 end in 4).

If a number has 3 zeros at the end, how many zeros will its square have?
6 zeros — squaring doubles the count of trailing zeros, so squares can only have an even number of trailing zeros.

Can a cube end with exactly two zeroes?
No — cubing multiplies the trailing-zero count by 3, so a cube's trailing zeros are always a multiple of 3 (0, 3, 6, 9…), never 2.

91+93+95+…+109 = ?
This is the 10th run of consecutive odd numbers, which always sums to n^3: the answer is **10^3 = 1000**.

Find the cube roots of (i) 64 (ii) 512 (iii) 729.
4, 8, 9 respectively.

Taxicab numbers: express 4104 and 13832 as a sum of two positive cubes, two ways each.
4104 = 2^3+16^3 = 9^3+15^3. 13832 = 2^3+24^3 = 18^3+20^3. (These follow 1729 = 1^3+12^3 = 9^3+10^3, the famous Hardy–Ramanujan number.)

Why This Chapter Matters

Squares, cubes and their roots via prime factorisation are used constantly in later chapters — the

Baudhayana–Pythagoras Theorem (Ganita Prakash Part 2) depends directly on squares, and exponent rules, mensuration (area, volume) and algebra all build on the number-pattern thinking introduced here.

Class 8 Mathematics Chapter 1 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the [Class 8 Mathematics Chapter 1 Extra Questions] and [Class 8 Mathematics Chapter 1 Revision Notes] for quick revision and extra practice.