

CLASS 8 MATHEMATICS
Worksheet: Squares, Cubes & Power Play

Based on Ganita Prakash, Chapter 1 – A Square and a Cube • NCF-SE 2023

Name: _____	Section: _____	Date: _____
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Time: 60 minutes	Total Marks: 40	Marks Obtained: _____
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Section 1: Squares – Basics & Properties

Answer the following questions.

1. Find the squares of: (a) 23 (b) 47 (c) 105 (d) 89 [4]
2. Without actually calculating, state whether the following numbers are perfect squares. Give a reason using unit digit rule: (a) 1234 (b) 26569 (c) 5372 [3]
3. Using the pattern of consecutive odd numbers, find 12^2 by adding the first 12 odd numbers. [2]
4. Using the identity $a^2 = (a-1)^2 + (a-1) + a$, find 51^2 from 50^2 . [2]
5. How many non-square numbers lie between the following pairs of consecutive perfect squares? (a) 15^2 and 16^2 (b) 25^2 and 26^2 [2]
6. Fill in the blanks: (a) The square of an even number is always _____. (b) The square of an odd number is always _____. (c) A perfect square never ends in the digit _____ or _____ (state any two impossible unit digits). [3]

Section 2: Square Roots

Use the prime factorisation or repeated subtraction method as instructed.

7. Find the square root of 1024 by prime factorisation. [2]
8. Find the square root of 400 using the repeated subtraction of consecutive odd numbers method. [2]
9. Find the smallest number by which 1800 must be multiplied so that the product is a perfect square. Also find the square root of the product obtained. [3]
10. Find the smallest number by which 2700 must be divided so that the quotient is a perfect square. [2]
11. Estimate the square root of 550 by identifying the two nearest perfect squares between which it lies. [2]

Section 3: Cubes & Cube Roots

12. Find the cubes of: (a) 9 (b) 14 (c) 21 [3]
13. State whether the following numbers are perfect cubes (use unit digit / prime factorisation reasoning): (a) 216 (b) 500 (c) 1728 [3]
14. Find the smallest number by which 128 must be multiplied to make it a perfect cube. [2]
15. Find the cube root of 3375 by prime factorisation. [2]
16. Find the cube root of 8000 by the estimation (grouping of digits) method. [2]

Section 4: Power Play – Laws of Exponents



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Simplify using the laws of exponents. Show the law used at each step.

17. Simplify: (a) $2^3 \times 2^4$ (b) $5^7 \div 5^3$ (c) $(3^2)^4$ (d) 4^0 [4]

18. Simplify and express as a single power: (a) $7^2 \times 3^2$ (using $a^m \times b^m = (ab)^m$) (b) $10^5 \div 2^5$ [2]

19. Express in exponential form: (a) $2 \times 2 \times 2 \times 3 \times 3$ (b) $5 \times 5 \times 5 \times 5 \times 5$ [2]

20. Find the value of: (a) 2^{-3} (b) $(1/3)^{-2}$ (c) $5^0 + 3^0$ [3]

21. Simplify using laws of exponents: $[(2^3)^2 \times 2^4] \div 2^5$ [2]

22. Write 3,84,00,000 in standard (scientific) form. [2]

23. Which is greater: 3^4 or 4^3 ? Show your working. [2]



Section 5: Mixed & Higher-Order Thinking (HOTS)

24. A square garden has an area of 2025 m^2 . Find the length of one side of the garden. [2]
25. A cubical tank has a volume of 4913 m^3 . Find the length of one edge of the tank. [2]
26. Is 2025 a perfect square as well as related to the current year? Verify by finding its square root, and identify one more property of the number 2025 (Hint: think about the sum of cubes). [3]
27. If $3^x = 243$, find the value of x . [2]
28. A number when squared and then cubed gives the same last digit. Find one such single-digit number and justify. [2]

— End of Worksheet —



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