

**MID-TERM EXAMINATION — Class 8 Mathematics (Ganita Prakash)****Chapters:** A Square and A Cube · A Story of Numbers · Number Play**Max Marks: 50****Name:** _____**Time: 2 Hours****General Instructions:** All questions are compulsory. Four sections — A (10×1 mark, MCQ), B (5×2 marks), C (5×3 marks), D (3×5 marks). Show your working where required.**SECTION A****Multiple Choice Questions — 1 mark each**

- Q1.** The square of 15 is: **[1]**
- (a) 225
(b) 125
(c) 30
(d) 45
-
- Q2.** The value of $\sqrt{144}$ is: **[1]**
- (a) 11
(b) 12
(c) 14
(d) 72
-
- Q3.** The cube of 4 is: **[1]**
- (a) 12
(b) 16
(c) 64
(d) 8
-
- Q4.** The value of $\sqrt[3]{27}$ is: **[1]**
- (a) 3
(b) 9
(c) 27
(d) 6
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- Q5.** Which of the following is a perfect square? **[1]**
- (a) 45
(b) 50
(c) 49
(d) 52
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- Q6.** The Roman numeral for 40 is: **[1]**
- (a) XXXX
(b) XL
(c) LX
(d) VL

Q7. The units digit of 27^2 is: **[1]**

(a) 4
(b) 7
(c) 9
(d) 1

Q8. The number of zeros in the cube of 10 is: **[1]**

(a) 1
(b) 2
(c) 3
(d) 4

Q9. Which of the following is a perfect cube? **[1]**

(a) 8
(b) 18
(c) 20
(d) 28

Q10. The value of $1 + 3 + 5 + 7$ is: **[1]**

(a) 14
(b) 15
(c) 16
(d) 18

SECTION B

Short Answer — 2 marks each

Q11. Find the square root of 1024 by the prime factorisation method. **[2]**

Q12. Is 500 a perfect cube? If not, find the smallest number by which it must be multiplied to make it a perfect cube. **[2]**

Q13. Write the number 2024 in Roman numerals. **[2]**

Q14. Find the cube root of 2744 by the prime factorisation method. **[2]**

Q15. Using the pattern $1 = 1^2$, $1 + 3 = 2^2$, $1 + 3 + 5 = 3^2$, ..., find the value of $1 + 3 + 5 + 7 + 9 + 11$. **[2]**

SECTION C

Short Answer — 3 marks each

Q16. Find the smallest number by which 2925 must be divided so that the quotient is a perfect square. Also find the square root of the quotient. **[3]**

Q17. Find the square roots of 4096 and 5476. **[3]**

Q18. Write the number 'seventy-three lakh six thousand and five' in figures using the Indian place-value system, and then rewrite it in the international system with commas. **[3]**

Q19. A two-digit number is such that the sum of its digits is 9. When the digits are reversed, the new number is 27 less than the original. Find the original number. **[3]**

Q20. Find the cube root of **13824** by the prime factorisation method.

[3]

SECTION D

Long Answer — 5 marks each

Q21. (a) Find the square root of **2401** by prime factorisation. (b) Find the smallest number that must be added to **525** to make it a perfect square, and write that perfect square.

[5]

Q22. (a) Write the successor and the predecessor of the largest **5**-digit number. (b) How many natural numbers lie between **20^2** and **21^2** ?

[5]

Q23. (a) Using divisibility rules, check whether **61452** is divisible by **3** and by **9**. (b) Using the fact that the sum of the first **n** odd numbers is **n^2** , find **$1 + 3 + 5 + \dots + 49$** .

[5]

— All the Best! —

ANSWER KEY & MARKING SCHEME

SECTION A

Answers

- Q1. (a) 225
- Q2. (b) 12
- Q3. (c) 64
- Q4. (a) 3
- Q5. (c) 49
- Q6. (b) XL
- Q7. (c) 9 ($7^2 = 49$)
- Q8. (c) 3 ($10^3 = 1000$)
- Q9. (a) 8 ($= 2^3$)
- Q10. (c) 16 ($= 4^2$)

SECTION B

Answers

- Q11. $1024 = 2^{10}$; $\sqrt{1024} = 2^5 = 32$.
- Q12. $500 = 2^2 \times 5^3$. The factor 2 is not a triple, so 500 is not a perfect cube. Multiply by 2: $500 \times 2 = 1000 = 10^3$.
- Q13. 2024 = MMXXIV.
- Q14. $2744 = 2^3 \times 7^3$; $\sqrt[3]{2744} = 2 \times 7 = 14$.
- Q15. $1 + 3 + 5 + 7 + 9 + 11 =$ sum of first 6 odd numbers $= 6^2 = 36$.

SECTION C

Answers

- Q16. $2925 = 3^2 \times 5^2 \times 13$. Divide by 13 (unpaired factor): $2925 \div 13 = 225$, and $\sqrt{225} = 15$.
- Q17. $\sqrt{4096} = 64$ (since $64^2 = 4096$); $\sqrt{5476} = 74$ (since $74^2 = 5476$).
- Q18. Indian system: 73,06,005. International system: 7,306,005.
- Q19. Let the digits be t (tens) and u : $t + u = 9$ and $(10t + u) - (10u + t) = 27 \Rightarrow 9(t - u) = 27 \Rightarrow t - u = 3$. So $t = 6$, $u = 3$; the number is 63 (check: $63 - 36 = 27$).
- Q20. $13824 = 2^9 \times 3^3$; $\sqrt[3]{13824} = 2^3 \times 3 = 24$.

SECTION D

Answers

- Q21. (a) $2401 = 7^4$, so $\sqrt{2401} = 7^2 = 49$. (b) $22^2 = 484$ and $23^2 = 529$; since $484 < 525 < 529$, add $529 - 525 = 4$. Then $525 + 4 = 529 = 23^2$.
- Q22. (a) Largest 5-digit number = 99999; successor = 100000, predecessor = 99998. (b) Between n^2 and $(n+1)^2$ there are $2n$ numbers, so between 20^2 and 21^2 there are $2 \times 20 = 40$ numbers.
- Q23. (a) Digit sum of 61452 = $6 + 1 + 4 + 5 + 2 = 18$. Since 18 is divisible by both 3 and 9, the number 61452 is divisible by both 3 and 9. (b) $49 = 2(25) - 1$, so it is the 25th odd number; hence $1 + 3 + \dots + 49 = 25^2 = 625$.