ALLEN
Intelli Brain®

Experiential Experimental Edutaining

MATHS

SAMPLE BOOK

8 GRADE

MATHS

I'm the

Intelli Kid

....

and

I'm becoming the

Best Version

of myself with

ALLEN

Intelli Brain ®

Experiential **E**xperimental **E**dutaining
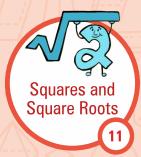
INDEX
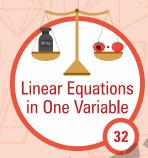
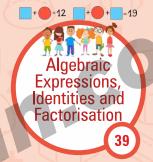**GRADE-8**

ALLEN IntelliBrain®

Experiential Experimental Edutaining

I AM PROGRESSING

(Tick mark the columns after achieving the Learning Milestones)

TOPIC	1st Learning	Exercise Solving	1st Revision	2nd Revision
Rational Numbers				
Squares and Square Roots				
Cubes and Cube Roots				
Exponents and Powers				
Linear Equations in One Variable				
Algebraic Expressions, Identities and Factorisation				
Playing with Numbers				
Introduction to Graphs and Data Handling				
Symmetry				
Visualising Solid Shapes				

ALLEN IntelliBrain®

Experiential Experimental Edutaining

MATHS

SAMPLE THEORY

SQUARE NUMBER / PERFECT SQUARE

Any natural number m can be expressed as n^2, where n is also a natural number, then m is known as a square number.

The square numbers are also called as perfect squares.

Example: Let m = 36.

Now, 36 can be expressed as 6^2, where 6 is a natural number. Therefore, 36 is a square number.

PROPERTIES OF SQUARE NUMBERS

The following table shows the square of numbers from 1 to 20.

Number	Square No.	Number	Square No.
1	1	11	121
2	4	12	144
3	9	13	169
4	16	14	196
5	25	15	225
6	36	16	256
7	49	17	289
8	64	18	324
9	81	19	361
10	100	20	400

◆ The unit's place digit of square numbers can be 0, 1, 4, 5, 6 or 9. No square number can end with the digits 2, 3, 7 or 8.

   Example : 152,1657,2348,453 are not perfect squares.

● The ones digit in the square of a number can be determined if the ones digit of the number is known.

Examples	The square of the number would end in	If the number ends in
1 or 9	1	$11^2 = 121$; $19^2 = 361$
2 or 8	4	$12^2 = 144$; $18^2 = 324$
4 or 6	6	$14^2 = 196$; $16^2 = 256$
3 or 7	9	$13^2 = 169$; $17^2 = 289$
5	5	$15^2 = 225$
0	0	$20^2 = 400$

● The number of zeros at the end of a perfect square is always even and is double the number of zeros at the end of the number.

Example:

$$\text{One zero} \rightarrow \begin{cases} 10^2 = 100 \\ 50^2 = 2500 \end{cases} \text{Two zeros}$$

$$\text{Two zeros} \rightarrow (600^2 = 360000) \rightarrow \text{Four zeros}$$

● There are '2n' non perfect square numbers between the squares of two consecutive natural numbers n and (n + 1).

Example: Between $3^2 (= 9)$ and $4^2 (= 16)$, 10, 11, 12, 13, 14, 15 non square numbers exist.

● A square number can be expressed as sum of the consecutive odd numbers starting from 1.

Example: $3^2 = 9 = 1 + 3 + 5$

$6^2 = 36 = 1 + 3 + 5 + 7 + 9 + 11$

● A square number can be expressed as summation of two consecutive natural numbers.

Example: $5^2 = 25 = 12 + 13; 7^2 = 49 = 24 + 25$

● If (n + 1) and (n – 1) are two consecutive even or odd numbers, then their product

i.e. (n + 1) (n – 1) = $n^2 – 1$.

Example: $11 \times 13 = (12 – 1) \times (12 + 1) = 12^2 – 1$

$13 \times 15 = (14 – 1) \times (14 + 1) = 14^2 – 1$

MATHS

SAMPLE EXERCISE

Directions: Solve the following multiple choice questions by choosing the most appropriate option.

1. The value of $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$ is _____.
   (1) 4   (2) 6   (3) 8   (4) 10

2. If $x*y = x + y + \sqrt{xy}$, then find value of 6*24.
   (1) 41   (2) 42   (3) 43   (4) 44

3. $\sqrt{0.01 + \sqrt{0.0064}} = $ _____.
   (1) 0.03   (2) 0.3   (3) 0.42   (4) None of these

4. What should come in place of x in $\dfrac{x}{\sqrt{128}} = \dfrac{\sqrt{162}}{x}$?

   (1) 12   (2) 14   (3) 144   (4) 196

5. If $\sqrt{1369} + \sqrt{0.0615 + x} = 37.25$, then find the value of x.
   (1) 10^{-1} (2) 10^{-2} (3) 10^{-3} (4) None of these

6. Find the value of is $\sqrt{\dfrac{(0.03)^2 + (0.21)^2 + (0.065)^2}{(0.003)^2 + (0.021)^2 + (0.0065)^2}}$.

   (1) 0.1   (2) 10^{-3} (3) 10   (4) 10^3

7. Which one of the following numbers has rational square root ?
   (1) 0.4   (2) 0.09   (3) 0.9   (4) 0.025

8. The least 4 digits number which is a perfect square is _____.
   (1) 1000   (2) 1016   (3) 1024   (4) 1036

9. Which one of the triplets given below is Pythagorean triplet ?
   (10, 24, 26),   (9, 11, 13),   (5, 7, 9),   (7, 10, 13)
   (1) (7, 10, 13)   (2) (9, 11, 13)   (3) (10, 24, 26)   (4) (5, 7, 9)

10. Rs. 7744 were collected in a school in the form of fee. If each student is paid as many rupees as there were the number of students in the school. How many students were there ?
    (1) 78   (2) 88   (3) 98   (4) 68

11. **Find the value of is**

$$\sqrt{52\frac{857}{2116}}$$

(1) 7 $\frac{11}{46}$ (2) 8 $\frac{13}{46}$ (3) 6 $\frac{12}{47}$ (4) 5 $\frac{11}{46}$

12. **Evaluate:**

$$\sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}$$

(1) 3   (2) 5   (3) 6   (4) 6.4

13. **How many two digit numbers satisfy this property : The last digit (unit's digit) of the square of the two digit number is 8 ?**

(1) 1   (2) 2   (3) 3   (4) 0

14. **Calculate the value of**

$$\sqrt{6.81} + \sqrt{6.81} + \sqrt{1.21} + \sqrt{0.0809}$$

(1) 2.03   (4) 2.13

15. **If** $\sqrt{18225} = 135$, **then find the value of** $\left(\sqrt{182.25} + \sqrt{1.8225} + \sqrt{0.018225} + \sqrt{0.00018225}\right)$.

(1) 1.49985   (2) 14.9985   (3) 149.985   (4) 1499.85

16. **If** $\sqrt{0.04 \times 0.4 \times a} = 0.004 \times 0.4 \times \sqrt{b}$, **then find value of** $\frac{a}{b}$.

(1) 16×10^{-3} (2) 16×10^{-4} (3) 16×10^{-4} (4) None of these

17. **Three fifth of the square of a certain number is 126.15. What is the number ?**

(1) 14.5   (2) 75.69   (3) 145   (4) 210.25

18. **If** $\sqrt{1 + \frac{55}{729}} = 1 + \frac{a}{27}$, **then calculate the value of a.**

(1) 1   (2) 3   (3) 5   (4) 7

19. **Find the value of**

$$\sqrt{\frac{0.081 \times 0.324 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$$

(1) 0.024   (3) 2.4   (4) 24

20. **If a = 0.1039, then the value of** $\sqrt{4a^2 - 4a + 1} + 3a$ **is** _____.

(1) 0.1039   (2) 0.2   (3) -0.4805   (4) 1.1039

21. **What least number must be multiplied to 12298 so that the product becomes a perfect square ?**

(1) 2   (2) 3   (3) 4   (4) 5