CHAPTER 6

SQUARES AND SQUARE ROOTS

- A number multiplied by itself is called a square of that number.
- Ones digit of a square number can be one of 0, 1, 4, 5, 6, 9.
- A square number must have even number of zeros at the end *e.g.,* 400, 90000, 4000000 etc.
- Sum of first n odd numbers is n^2 *e.g.,* sum of first five odd numbers

  i.e., $1 + 3 + 5 + 7 + 9 = 25 = 5^2 = n^2$
- Difference of squares of two consecutive numbers can be obtained by adding those two numbers

  e.g., $59^2 - 58^2 = (59 + 58)\ (59 - 58) = (59 + 58) \times 1 = 117$
- A pythagorean triplet can be obtained by taking squares of odd numbers *i.e.,*

  $3^2 = 9 = 4 + 5$ Triplet (3, 4, 5)

  $5^2 = 25 = 12 + 13$ Triplet (5, 12, 13)

  $7^2 = 49 = 24 + 25$ Triplet (7, 24, 25) and so on.
- $35^2 = \underline{3 \times 4}\ \ \underline{25} = 1225$

  For writing 35^2 or square of any number with ones digit five, two digits to right of the answer will be always 25 and left hand side digits can be obtained by multiplying the next natural number.

  e.g., $75^2 = \underline{7 \times 8}\ \ \underline{25} = 5625$

QUESTIONS

1. What is the square of 17?
2. Find the square of 24.
3. What is the product of two odd numbers?
4. Can we have a square number with unit digit 8?

5. Which are the digits the square number can have at units place?
6. How many 2's are there in the prime factors of 300?
7. How many 5's are there in the prime factors of 13000?
8. How many digits will be there in the square root of 12321?
9. How much is $45^2 - 44^2$?
10. Find the value of $(39 + 21)^2$.
11. What is the missing digit in $(37)^2 = 136 - ?$
12. Find the value of $121^2 - 120^2$.
13. Simplify and give the answer : $\sqrt{62 \times 28}$.
14. How many natural nos lie between 56^2 and 57^2.
15. What is the square of $\frac{19}{20}$?
16. Find the square of (3.1).
17. How much is $(0.1)^2$?
18. Find the value of $\sqrt{0.0081}$.
19. Give the square number between 36 and 64.
20. How many square numbers lie between 81 and 225?
21. Follow the pattern and answer.

    Pattern $1 = 1^2$

    $1 + 3 = 2^2$

    $1 + 3 + 5 = 3^2$ Find $1 + 3 + 5 + 7 + 9$,
22. What is the sum of first ten odd numbers?
23. What is the sum of the first 21 odd numbers?
24. Find the sum 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21

    [Hint : Write as (1 + 3 + 5 + 7 ..... + 21) – (1 + 3) = $11^2 - 2^2$ = 117]
25. Find 7 + 9 + 11 + 13 + 15 + 17.
    [Hint : make pairs (7 + 17) + (9 + 15) + (11 + 13) = 24 × 3 = 72]
26. What should be added to 45^2 to get 46^2.
27. How much is $87^2 - 86^2$?
28. Find the value of $85^2 - 80^2$?
29. What should be subtracted from 37^2 to get 35^2?
    [Hint : $37^2 - 35^2 = 72 \times 2$. Therefore number is 144].

30. What should be subtracted from 121^2 to get 120^2?

31. Fill in the blanks : $116^2 + \_\_\_\_ = 117^2$

32. Which two consecutive numbers on adding gives a square number 81.

33. $\left(\sqrt{4900} \div 10\right)^2 = \_\_\_\_\_$.

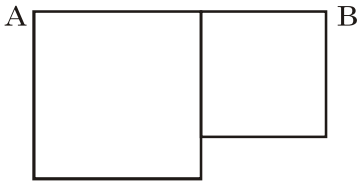
34. $(a + b)^2 - (a - b)^2 = \_\_\_\_\_$.

35. If $21^x = 441$ then $x = \_\_\_\_\_$.

36. Find the smallest number which when multiplied by 180 makes it a perfect square.

37. If the area of a square is 38.44 sq. cm. then find the side of the square.

38. In the adjoining figure, find the length AB if areas of two squares are 81 sq. cm. and 25 sq. cm. respectively?



39. Find the least number which when added to 599 to make it a perfect square.

40. How much is $\sqrt{\frac{441}{1369}}$?

41. Find $\left(\frac{-2}{5}\right)^2 - \left(\frac{1}{5}\right)^2 = \_\_\_\_\_$.

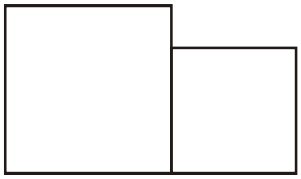
42. In a cinema hall 729 people are seated in such a way that the number of people in a row is equal to number of rows. Then how many rows of people are there in the hall?

43. Simplify $\sqrt{1024} - \sqrt{900}$.

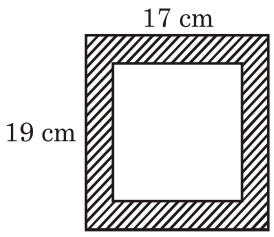
44. The length of a rectangular park is 80m and breadth is 60m. Find the length of its diagonal.

45. Give one Pythagorean triplet in which one of the number is 12.

46. Two squares of sides 11 cm. and 9 cm are joined together to form a toy. What is the area of the Fig. so formed?



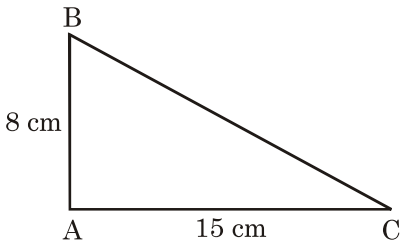
47. In the figure side of bigger square is 19 cm and smaller square is 17cm. What is the area of the shaded portion?



48. A rectangular paper of length 45cm and breadth 5 cm is cut to form a square with the same area. What is the side of the square?

49. Find the missing number. $175 \times \_\_\_\_\_ = 35^2$.

50. In the figure find the length of *BC*.



ANSWERS

1.	289	2.	576
3.	Odd number	4.	No.
5.	(0, 1, 4, 5, 6, 9)	6.	Two, 2's
7.	Three. 5's	8.	3
9.	89	10.	3600
11.	9	12.	241
13.	42	14.	112
15.	$\frac{361}{400}$	16.	9.61
17.	0.01	18.	0.09
19.	49	20.	5
21.	5^2	22.	100
23.	$(21)^2 = 441$	24.	117
25.	72	26.	91
27.	173	28.	825
29.	144	30.	241
31.	233	32.	40, 41

33. 49
34. $4ab$
35. 2
36. 5
37. 6.2 cm
38. 14 cm
39. 26
40. $\frac{21}{37}$
41. $\frac{3}{25}$
42. 27
43. 2
44. 100 m
45. (5, 12, 13)
46. 202 sq. cm.
47. 72 sq. cm.
48. 15 cm
49. 7
50. 17 cm

TEST YOUR KNOWLEDGE

1. What is square root of 441.
2. The square of $\frac{10}{11}$ is _____ .
3. $(0.7)^2$ = _____.
4. $(45)^2$ = _____.
5. What is the least number of four digits which is a perfect square?
6. $99^2 - 98^2$ = _____.
7. Find the greatest number of two digits which is a perfect square.
8. Find the square root of $\frac{256}{625}$.
9. What is $\sqrt{12.25}$.
10. Give a pythagorean triplet whose one number is 13.

ANSWERS

1. 21
2. $\frac{100}{121}$
3. 0.49
4. 2025
5. 1024
6. 197
7. 81
8. $\frac{16}{25}$
9. 3.5
10. (5, 12, 13)