

7th Squares and Cubes

1. Square of 111 —

(a) 11111 (b) 12321 (c) 12431 (d) 12451

Answer:- $111 \times 111 = 12321$

2. Square of 52 =

(a) 2704 (b) 2702 (c) 2504 (d) 2774

Answer :- $52 \times 52 = 2704$

3. Square of 115 —

(a) 13325 (b) 12125 (c) 15625 (d) 13225

Answer:- $115 \times 115 = 13225$

4. Square of an even number is always

(a) Prime (b) Odd (c) Even (d) Even-prime

Answer:- Square of an even number is always EVEN

5. Square of an odd number is always
(a) Odd (b) Even (c) Prime (d) Even prime

Answer:- ODD

6. Square of a proper fraction is ----- the proper fraction.

(a) Less than or equal to (b) Less than (c) Greater than (d) Equal to

Answer:- Square of a proper fraction is Less than the proper fraction.

7. Square of a number means the number multiplied by -----

Answer:- Square of a number means the number multiplied by itself

8. Sum of first n odd numbers is given by

Answer :- Sum of first n odd numbers is given by n^2

$$1+3 = 4 = 2^2$$

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

$$1+3+5+7 = 16 = 4^2$$

9. Square root of 31.32 =

(a) 5.50 (b) 5.59 (c) 4.84 (d) 4.92

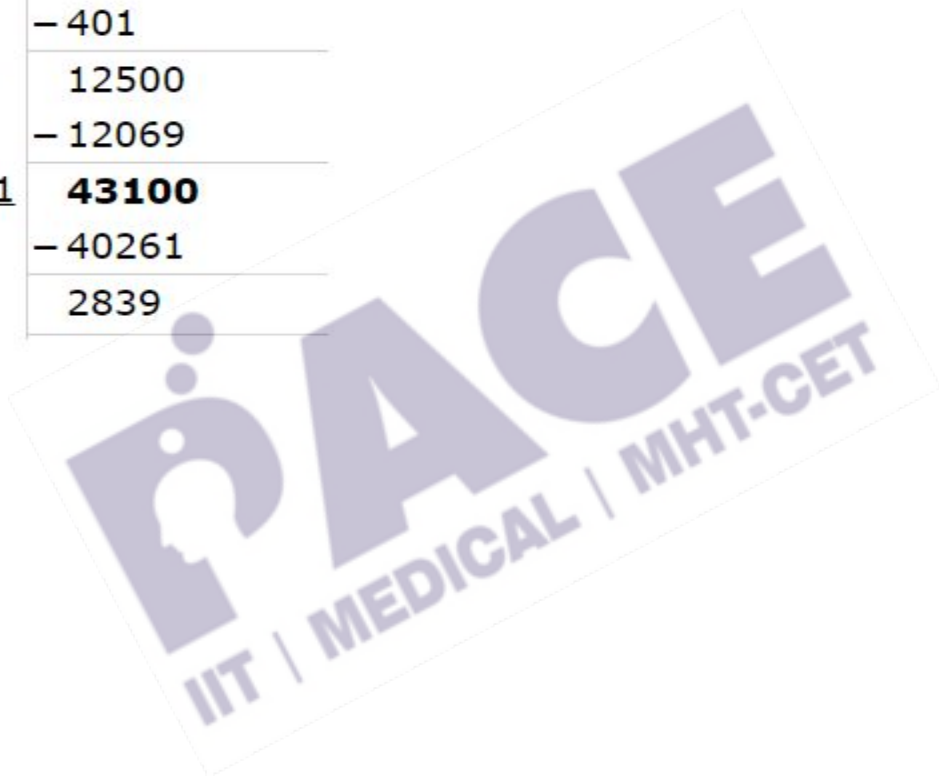
	5.596
5	31.320000
+ 5	- 25
105	632
+ 5	- 525
1109	10700
+ 9	- 9981
11186	71900
	- 67116
	4784

PACE
IIT | MEDICAL | MHT-CET

10. Square root of 405.26—

(a) 20.09 (b) 20.13 (c) 20.26 (d) 20.31

	20.131
2	0405.260000
+2	-4
40	005
+0	-0
401	526
+1	-401
4023	12500
+3	-12069
40261	43100
	-40261
	2839



11. Square root of 500 =

(a) 22.30 (b) 22.32 (c) 22.36 (d) 32.30

	22.360
2	0500.000000
+2	-4
4 <u>2</u>	100
+2	-84
44 <u>3</u>	1600
+3	-1329
446 <u>6</u>	27100
+6	-26796
4472 <u>0</u>	30400
	-0
	30400

12. Square root of $7/4$

(a) 0.84 (b) 1.12 (c) 1.32 (d) 1.41

	1.322
1	01.750000
+1	-1
2 <u>3</u>	075
+3	-69
26 <u>2</u>	600
+2	-524
264 <u>2</u>	7600
	-5284
	2316

13. Cube of 13 =

(a) 2197 (b) 2744 (c) 2729 (d) 2097

$$13 \times 13 \times 13 = 2197$$

14. Cube of 35=

(a) 40875 (b) 45875 (c) 46875 (d) 42875

$$35 \times 35 \times 35 = 42875$$

15. Cube root of 4096 =

(a) 12 (b) 14 (c) 26 (d) 16

$$4096 = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)$$

$$(4096)^{\frac{1}{3}} = 2 \times 2 \times 2 \times 2 = 16$$

1. Squares are always

(a) Non-negative (b) Negative (c) Prime (d) Even

Non-negative

$$(-ve)^2 = -ve \times -ve = \text{Positive}$$

$$(+ve)^2 = +ve \times +ve = \text{Positive}$$

2. Sum of first 7 odd numbers =

(a) 42 (b) 56 (c) 49 (d) 64

Sum of first n odd numbers is given by n^2
 $\Rightarrow 7^2 = 49$

3. Sum of first 35 odd numbers =

(a) 1325 (b) 925 (c) 1225 (d) 1235

Sum of first n odd numbers is given by n^2
 $\Rightarrow 35^2 = 1225$

4. Square root of 500 upto 2 decimal places =

(a) 21.26 (b) 22.36 (c) 22.39 (d) 23.16

	22.36
2	0500.0000
+2	-4
42	100
+2	-84
443	1600
+3	-1329
4466	27100
	-26796
	304

5. Square root of 706 upto 2 decimal places =

(a) 25.57 (b) 26.57 (c) 26.88 (d) 27.88

	26.57
2	0706.0000
+ 2	- 4
4 <u>6</u>	306
+ 6	- 276
52 <u>5</u>	3000
+ 5	- 2625
530 <u>7</u>	37500
	- 37149
	351

6.

$\sqrt{\frac{5}{6}}$ upto 2 decimal places =

(a) 0.72

(b) 0.81

(c) 0.86

(d) 0.91

Answer:- $\frac{5}{6} = 0.8333$

So find square root of 0.8333 using long division method

7.

$\frac{3}{\sqrt{4}}$ upto 2 decimal places =

(a) 1.50

(b) ± 1.50

(c) 1.75

(d) ± 1.75

Given question can be written as $3/2 = 1.5$

8. Square of 11111 =

(a) 123454321 (b) 12345654321 (c) 123451 (d) 12345321

11111 x 11111 = 123454321

1 x 1 = 1
11 x 11 = 121
111 x 111 = 12321
1111 x 1111 = 1234321
11111 x 11111 = 123454321
111111 x 111111 = 12345654321
1111111 x 1111111 = 1234567654321
11111111 x 11111111 = 123456787654321
111111111 x 111111111 = 12345678987654321

9. Square of an even number + square of an odd number =

(a) Prime number (b) Even prime number (c) Even number (d) Odd number

Sq. of even number + Sq. of odd number = Odd number

$$2^2 + 5^2 = 4 + 25 = 29$$

$$4^2 + 7^2 = 16 + 49 = 65$$

10. Cubes are

(a) Positive (b) Negative (c) Even (d) Negative as well as positive

=> D

$$2^3 = 2 \times 2 \times 2 = 8$$

$$(-2)^3 = (-2) \times (-2) \times (-2) = -8$$

11 Cube root of 10,648 =

(a) 22 (b) 26 (c) 32 (d) 36

$$10648 = 2 \times 2 \times 2 \times 11 \times 11 \times 11$$

So cube root of 10648 is = $2 \times 11 = 22$

12.

$$\sqrt{196y^4} =$$

(a) $14y^2$

(b) $14y^4$

(c) $12y^2$

(d) $12y^4$

$$\Rightarrow 196 = 14 \times 14$$

Therefore $14y^2$

13. Cube root of 42,875 = (a) 45 (b) 305 (c) 35 (d) 405

$$42,875 = 5 \times 5 \times 5 \times 7 \times 7 \times 7$$

Therefore cube root is $= 5 \times 7 = 35$

14. Cube root of 74088 =

(a) 32 (b) 42 (c) 52 (d) 62

$$74088 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7$$

Therefore cube root is $2 \times 3 \times 7 = 42$

15.

$$\sqrt[3]{1000x^6} =$$

(a) $10x^2$

(b) $100x^2$

(c) $10x^3$

(d) $100x^3$

$$1000 = 10 \times 10 \times 10$$

$$x^6 = x^2 \times x^2 \times x^2$$

Therefore cube root is $10x^2$

Level 1

1. Find the sum of the first 15 odd numbers.

Sum of first n odd numbers is given by n^2

$$\Rightarrow 15^2 = 225$$

2. Find the square root of 24 upto 3 decimal places.

	4.898
4	24.000000
+4	-16
<u>88</u>	800
+8	-704
<u>969</u>	9600
+9	-8721
<u>9788</u>	87900
	-78304
	9596

3. Find the square root of 56 upto 2 decimal places.

	7.48
7	56.0000
+7	-49
144	700
+4	-576
1488	12400
	-11904
	496

4. Find square of (i) 52

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(52)^2 = (50 + 2)^2 = 50^2 + 2(50)(2) + 2^2$$
$$= 2500 + 200 + 4 = 2704$$

(ii) 56

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(56)^2 = (50 + 6)^2 = 50^2 + 2(50)(6) + 6^2$$
$$= 2500 + 600 + 36 = 3136$$

(iii) 501

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(501)^2 = (500 + 1)^2 = 500^2 + 2(500)(1) + 1^2$$
$$= 251001$$

5. Find square of

(i) 35

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$(35)^2 = (40 - 5)^2 = 40^2 + 2(40)(5) + 5^2$$

$$1600 - 400 + 25 = 1225$$

(ii) 205

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(205)^2 = (200 + 5)^2 = 42025$$

(iii) 365

$$(400 - 35)^2 = 133225$$

PACE
IIT | MEDICAL | MHT-CET

6.

$\sqrt{8} \times \sqrt{8} = x$. Find the value of x.

$$x = 8$$

7.

Find square root of $676x^4y^6z^2$

$$26 \times 26 = 676$$

$$x^2 \times x^2 = x^4$$

$$y^3 \times y^3 = y^6$$

$$z \times z = z^2$$

So answer is $26x^2y^3z$

8. Find square root of $256(x+y)^2$

$$\Rightarrow 16(x+y)$$

9. Find the value of $(6)^3 \times (2)^2 \times (4)^3$

$$\Rightarrow 6 \times 6 \times 6 \times 2 \times 2 \times 4 \times 4 \times 4 = 55,296$$

10. What is the difference between the sum of first 17 odd numbers and sum of first 15 odd numbers?

1, 3, 5, 7, 9, , 29.

Total number of terms

$n = 15$

Sum of first n odd numbers is given by n^2

$$\Rightarrow 15^2 = 225$$

1, 3, 5, 7, 9, , 29, 31, 33.

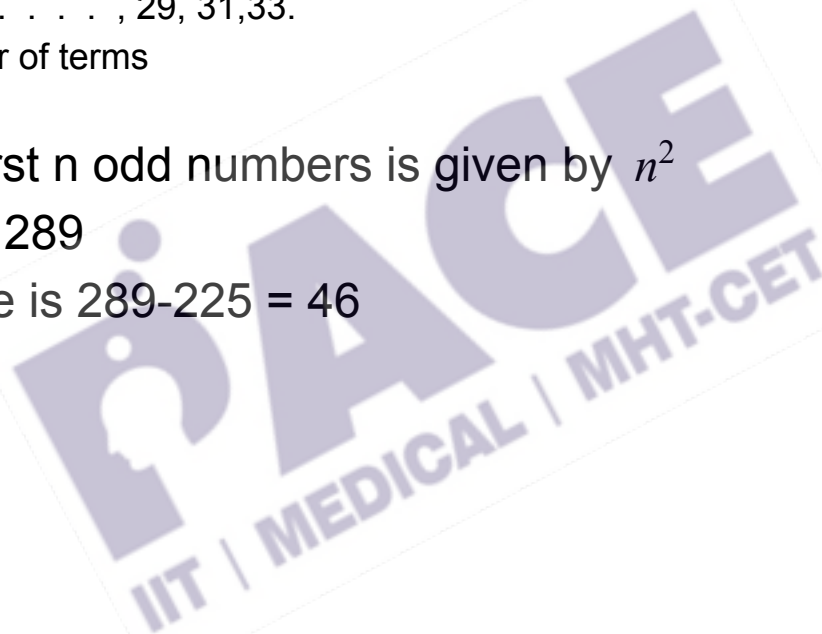
Total number of terms

$n = 17$

Sum of first n odd numbers is given by n^2

$$\Rightarrow 17^2 = 289$$

Difference is $289 - 225 = 64$



Level 2

1. A society collected Rs. 92.16. Each member collected as much paise as there were members. How many members were there and how much did each contribute ?

A society collected Rs 92.16.

Each member collected as much paise as there are members.

so let the number of members = s

contribution of each members will also be s

$$s*s= 92.16$$

$$s^2 = 92.16$$

$$s = \sqrt{92.16}$$

$$\Rightarrow s = 9.6 \text{ Rs.}$$

so each contributed 9.6 Rs.

we can say 10 people were there {not exactly}

[rounding of 9.6 = 10]

but if the question was

Rs 9216 then no.of people is 96

2. The area of a square field is 5184 sq. m. A rectangular field. Whose length is twice its breadth has its perimeter equal to the perimeter of the square field. Find the area of the rectangular field.

Area of square field = 5184m^2

Square root of 5184 = 72m

Therefore perimeter of square field = $4 * 72 = 288\text{m}$

Rectangular field.

Breadth = x

Length = $2x$

Perimeter = $2 * \text{length} + 2 * \text{breadth}$

= $2(2x) + 2(x)$

= $6x$

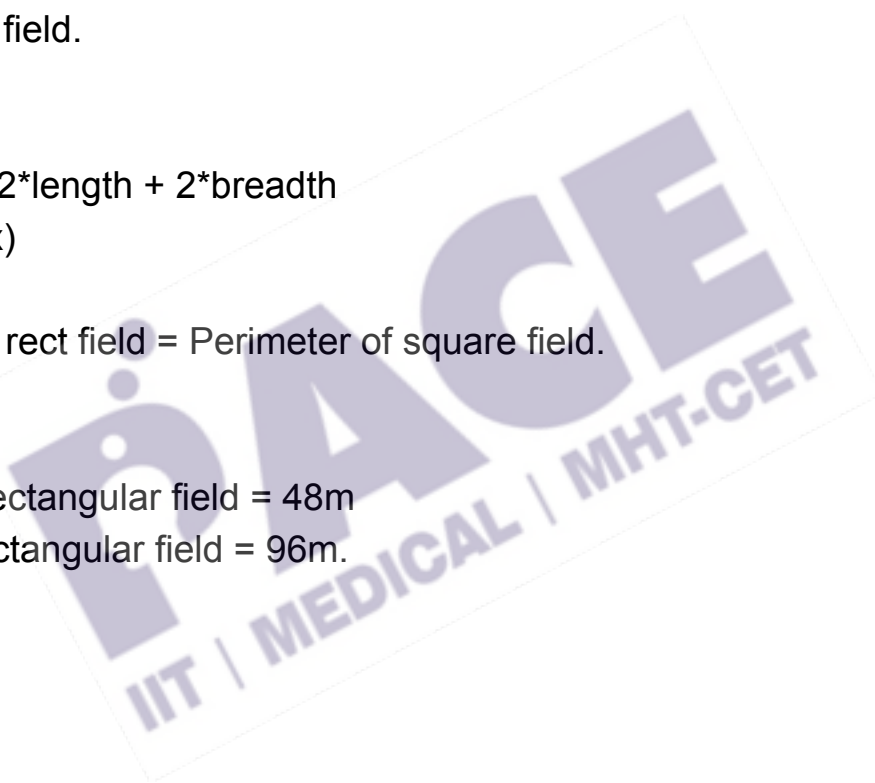
Perimeter of rect field = Perimeter of square field.

$6x = 288\text{m}$

$x = 48\text{m}$

Breadth of rectangular field = 48m

Length of rectangular field = 96m.



3. A PT teacher wants to arrange the maximum possible number of 6000 students in a field such that the number of rows is the same as the number of students in each row. How many rows are there if 71 were left out after arrangement.

Total number of students = 6000

Students are arranged in such a way that the number of row is equal to the number of columns

Due to this arrangement 71 students were left out

So, Number of students are in this arrangement = $6000 - 71$
 $= 5929$

Let x be the number of rows

Since no. of rows = No. of columns

So, No. of columns = x

So, $x \times x = 5929$

$$x^2 = 5929$$

$$x = \sqrt{5929}$$

$$x = 77$$

Hence the number of rows are 77.

Observe the following pattern :

$$1^3 = 1$$

$$1^3 + 2^3 = (1+2)^2$$

$$1^3 + 2^3 + 3^3 = (1+2+3)^2$$

Write the next three rows and calculate the value of $1^3 + 2^3 + 3^3 + \dots + 9^3 + 10^3$ by the above pattern.

$$\Rightarrow (1 + 2 + 3 + 4 + \dots + 10)^2 = (110/2)^2 = 3025$$

5. What is the smallest number by which 8192 must be divided so that quotient is a perfect cube ? Also, find the cube root of the quotient so obtained.

The given number is 8192

we have to do prime factorization

$$8192 = (2)^{13}$$

$$8192 = (2)^3 \times (2)^3 \times (2)^3 \times (2)^3 \times (2)^1$$

To become a perfect cube....The power should be 3

The power of remaining 2's is 1

But the power of one 2 is 1

So....it should be divided with 2

2 should be divided with 8192 to become a perfect cube...

6. Find the smallest number which when multiplied with 3600 will make the product a perfect cube. Further, find the cube root of the product.

$$\text{Required product} = 216000$$

and

$$\sqrt[3]{216000} = 60$$

Step-by-step explanation:

Resolving 3600 into prime factors, we get

$$3600 = \underline{2 \times 2 \times 2} \times 3 \times 3 \times 5 \times 5$$

The prime factors 2, 3 and 5 doesn't appear in a group of three.

So, 3600 is not a perfect cube.

Hence, the smallest number by which it is to be multiplied to make it perfect cube is $(2 \times 2 \times 3 \times 5) = 60$

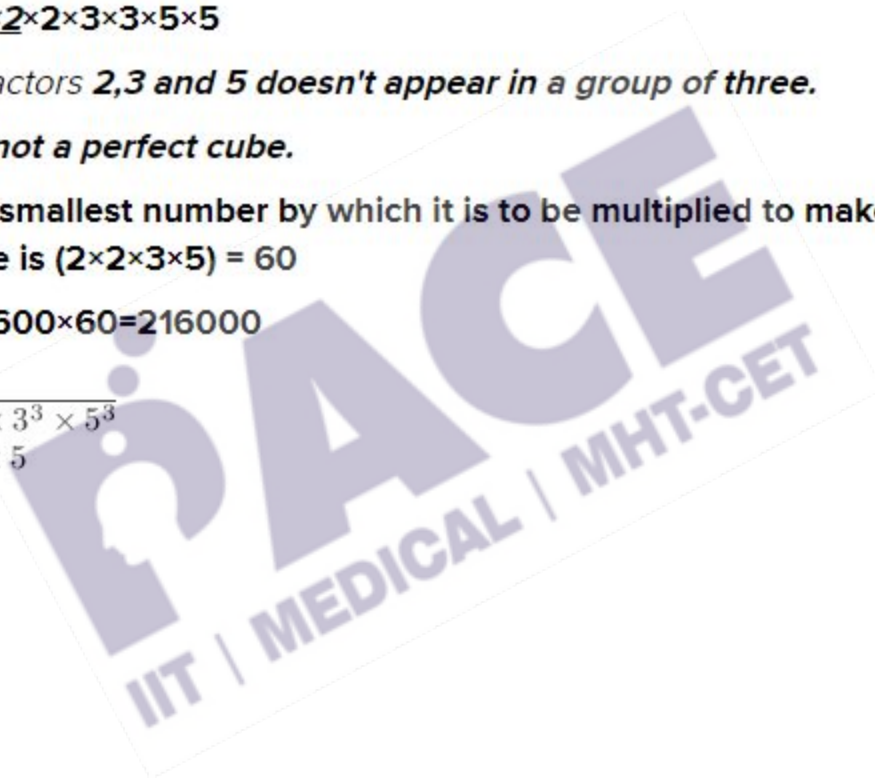
$$\text{product} = 3600 \times 60 = 216000$$

$$\sqrt[3]{3600 \times 60}$$

$$= \sqrt[3]{2^3 \times 2^3 \times 3^3 \times 5^3}$$

$$= 2 \times 2 \times 3 \times 5$$

$$= 60$$



7. Multiply 210125 by the smallest number so that the product is a perfect cube. Also , find out the cube root of the product.

as we know for being a number to cube it must have thrice of prime numbers in its factor. if it has thrice then it is called a perfect cube and if not then it is not a perfect cube.

factor of 210125 is

$$210125 = 5 \times 5 \times 5 \times 41 \times 41$$

it has a thrice of 5 but a pair of 41.

To make it a perfect cube we have to multiply by 41.

smallest number so that multiply by the number product is a perfect cube is 41

and cube root of 210125 is $5 \times 41 = 205$

8. Three numbers are in the ratio 2:3:4. The sum of their cubes is 0.334125. Find the numbers.

$$(2x)^3 + (3x)^3 + (4x)^3 = 0.334125$$

$$\Rightarrow 8x^3 + 27x^3 + 64x^3 = 0.334125$$

$$\Rightarrow 99x^3 = 0.334125$$

$$\Rightarrow x = 0.15$$

So, The three numbers are:

$$\begin{aligned} \therefore 2(0.15) &= 0.3, \\ 3(0.15) &= 0.45, \\ \text{and, } 4(0.15) &= 0.6 \end{aligned}$$

