NCERT SOLUTIONS OF square and square roots Exercise 1

Question 1

What will be the unit digit of the squares of the following numbers?

(i) 81

(ii) 272

(iii) 799

(iv) 3853

(v) 1234

(vi) 26387

(vii) 52698

(viii) 99880

(ix) 12796

(x) 55555

Answer

The unit digit square decide the number for the square of any number

1	1 Explanation: Since, $1^2 = 1$
2	4 Explanation: Since, $2^2 = 4$,
3	1 Explanation: Since, $9^2 = 81$

4	9
	Explanation: Since $3^2 = 9$
5	6
	Explanation: Since, $4^2 = 16$
6	9
	Explanation: Since, $7^2 = 49$
7	4
	Explanation: Since, $8^2 = 64$. So
8	0
	Since, $0^2 = 0$.
9	6
	Explanation: Since, $6^2 = 36$
10	5
	Explanation: Since, $5^2 = 25$

Question 2

The following numbers are obviously not perfect squares. Give reason.

(i)   1057
(ii)   23453
(iii)   7928
(iv)   222222
(v)   64000
(vi)   89722
(vii)   222000
(viii)   505050

Answer

The square of any number will have 0,1,4,5,6 or 9 at its unit place

So (i), (ii), (iii), (iv), (vi) don't have any of the 0, 1, 4, 5, 6, or 9 at unit's place, so they are not be perfect squares.

The square of Zeros will be even always

So (v), (vii) and (viii) don't have even number of zeroes at the end so they are not perfect squares.

Question 3

The squares of which of the following would be odd numbers?

(i)   431
(ii)   2826
(iii) 7779
(iv)   82004

Answer

(i)   431 square will end in 1,So odd number
(ii)   2826 square will end in 6 ,so even number
(iii)   779 square will end in 1,So odd number
(iv)   82004 square will end in 6 ,so even number

Question 4

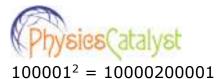 Observe the following pattern and find the missing digits.

$11^2 = 121$

$101^2 = 10201$

$1001^2 = 1002001$

$100001^2 = 1.........2.......1$

$10000001^2 = ...$

Solution:

$100001^2 = 10000200001$

$10000001^2 = 100000020000001$

Reasoning Start with 1 followed as many zeroes as there are between the first and the last one, followed by two again followed by as many zeroes and end with 1.

Question 5

Observe the following pattern and supply the missing numbers.

$11^2 = 121$

$101^2 = 10201$

$10101^2 = 102030201$

$1010101^2 = \ldots\ldots\ldots\ldots$

$\ldots\ldots\ldots\ldots^2 = 10203040504030201$
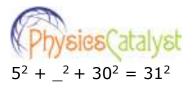
Answer

$1010101^2 = 1020304030201$

$101010101^2 = 10203040504030201$

Reasoning Start with 1 followed by a zero and go up to as many number as there are number of 1s given, follow the same pattern in reverse order.

Question 6

Using the given pattern, find the missing numbers.

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

$2^2 + 3^2 + 6^2 = 7^2$

$3^2 + 4^2 + 12^2 = 13^2$

$4^2 + 5^2 + \_^2 = 21^2$

$5^2 + \_^2 + 30^2 = 31^2$

$6^2 + 7^2 + \_^2 = \_^2$

Answer

We can see following pattern the above series

Relation among first, second and third number - Third number is the product of first and second number

Relation between third and fourth number - Fourth number is 1 more than the third number

So

$4^2 + 5^2 + 20^2 = 21^2$

$5^2 + 6^2 + 30^2 = 31^2$

$6^2 + 7^2 + 42^2 = 43^2$

Question 7

Without adding, find the sum.

(i) 1 + 3 + 5 + 7 + 9

(ii) 1 + 3 + 5 + 7 + 9 + I1 + 13 + 15 + 17 +19

(iii) 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23

Answer

Explanation:

$1 + 3 = 2^2 = 4$

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

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

$1 + 3 + 5 + 7 + 9 = 5^2 = 25$

So Sum of n odd numbers starting from 1 = n^2

From the above derivation we can answer the above questions

- i)   Since, there are 5 consecutive odd numbers, Thus, their sum = 5^2 = 25
- ii)   Since, there are 10 consecutive odd numbers, Thus, their sum = 10^2 = 100
- iii)   Since, there are 12 consecutive odd numbers, Thus, their sum = 12^2 = 144

Question 8

(i) Express 49 as the sum of 7 odd numbers.

(ii) Express 121 as the sum of 11 odd numbers.

Answer

Explanation:

1 + 3 = 2^2 = 4

1 + 3 + 5 = 3^2 = 9

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

1 + 3 + 5 + 7 + 9 = 5^2 = 25

So Sum of n odd numbers starting from 1 = n^2

- i)   Since, 49 = 7^2

So, 7^2 can be expressed as follows:

1 + 3 + 5 + 7 + 9 + 11 + 13

ii)   Since, $121 = 11^2$

Therefore, $121 = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21$

Question 9

How many numbers lie between squares of the following numbers?

(i) 12 and 13

(ii) 25 and 26

(iii) 99 and 100

Answer

i) $12^2 = 144$

$13^2 = 169$

Now, $169 - 144 = 25$

So, there are $25 - 1 = 24$ numbers lying between 12^2 and 13^2

ii)

We know that, $25^2 = 625$

And, $26^2 = 676$

Now, $676 - 625 = 51$

So, there are $51 - 1 = 50$ numbers lying between 25^2 and 26^2

iii)

We know that, $99^2 = 9801$

And, $100^2 = 10000$

Now, 10000 - 9801 = 199

So, there are 199 - 1 = 198 numbers lying between 99^2 and 100^2