Exercise 5.1 (Revised) - Chapter 6 - Square & Square Roots - Ncert Solutions class 8 - Maths

Updated On 11-02-2025 By Lithanya

Chapter 5 - Square & Square Roots - NCERT Solutions Class 8 Maths | Expert Solutions

Ex 5.1 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.

(i) The number 81 contains its unit's place digit 1 . So, square of 1 is 1 .
Hence, unit's digit of square of 81 is 1 .
(ii) The number 272 contains its unit's place digit 2. So, square of 2 is 4 .

Hence, unit's digit of square of 272 is 4 .
(iii) The number 799 contains its unit's place digit 9 . So, square of 9 is 81 .

Hence, unit's digit of square of 799 is 1 .
(iv) The number 3853 contains its unit's place digit 3 . So, square of 3 is 9 .

Hence, unit's digit of square of 3853 is 9 .
(v) The number 1234 contains its unit's place digit 4 . So, square of 4 is 16 .

Hence, unit's digit of square of 1234 is 6 .
(vi) The number 26387 contains its unit's place digit 7. So, square of 7 is 49 .

Hence, unit's digit of square of 26387 is 9 .

(vii) The number 52698 contains its unit's place digit 8 . So, square of 8 is 64 .

Hence, unit's digit of square of 52698 is 4 .
(viii) The number 99880 contains its unit's place digit 0 . So, square of 0 is 0 .

Hence, unit's digit of square of 99880 is 0 .
(ix) The number 12796 contains its unit's place digit 6 . So, square of 6 is 36 .

Hence, unit's digit of square of 12796 is 6 .
(x) The number 55555 contains its unit's place digit 5 . So, square of 5 is 25 .

Hence, unit's digit of square of 55555 is 5 .
Ex 5.1 Question 2.

The following numbers are obviously not perfect squares. Give reasons.
(i) 1057
(ii) 23453
(iii) 7928
(iv) 22222
(v) 64000
(vi) 89722 (vii) 222000
(viii) 505050

Answer.

(i) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,$ 9. Therefore 1057 is not a perfect square becaus it's place digit is 7 .
(ii) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,$ 9. Therefore 23453 is not a perfect square because its unit's place digit is 3 .
(iii) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,$ 9.Therefore 7928 is not a perfect square because its unit's place digit is 8 .
(iv) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,$ 9. Therefore 222222 is not a perfect square because its unit's place digit is 2 .

(v) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,9$. Therefore 64000 is not a perfect square because its unit's place digit is single 0 .
(vi) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,9$. Therefore 89722 is not a perfect square because its unit's place digit is 2 .
(vii) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,9$. Therefore 222000 is not a perfect square because its unit's place digit is triple 0 .
(viii) Since, perfect square numbers contain their unit's place digit $0,1,4,5,6,9$. Therefore 505050 is not a perfect square because its unit's place digit is 0 .

Ex 5.1 Question 3.

The squares of which of the following would be odd number:
(i) 431 (ii) 2826 (iii) 7779 (iv) 82004

Answer.

(i) 431 - Unit's digit of given number is 1 and square of 1 is 1 . Therefore, square of 431 would be an odd number.
(ii) 2826 - Unit's digit of given number is 6 and square of 6 is 36 . Therefore, square of 2826 would not be an odd number.
(iii) 7779 - Unit's digit of given number is 9 and square of 9 is 81 . Therefore, square of 7779 would be an odd number.
(iv) 82004 - Unit's digit of given number is 4 and square of 4 is 16. Therefore, square of 82004 would not be an odd number.

Ex 5.1 Question 4.

Observe the following pattern and find the missing digits:
$11^2 = 121$
$101^2 = 10201$
$1001^2 = 1002001$
$100001^2 = 1.......2.......1$
$10000001^2 = 1$

Answer.

$11^2 = 121$
$101^2 = 10201$
$1001^2 = 1002001$
$100001^2 = 10000200001$
$10000001^2 = 100000020000001$
Ex 5.1 Question 5.

Observe the following pattern and supply the missing numbers:

$11^2 = 121$
$101^2 = 10201$
$10101^2 = 102030201$
$1010101^2 =$
$2 = 10203040504030201$

Answer.

$11^2 = 121$
$101^2 = 10201$
$10101^2 = 102030201$
$1010101^2 = 1020304030201$
$101010101^2 = 10203040504030201$
Ex 5.1 Question 6.

Using the given pattern, find the missing numbers:
$1^2 + 2^2 + 2^2 = 3^2$
$2^2 + 3^2 + 6^2 = 7^2$
$3^2 + 4^2 + 12^2 = 13^2$

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

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

$6^2 + \_^2 + \_^2 = 43^2$

Answer:

$1^2+2^2+2^2=3^2$
$2^2+3^2+6^2=7^2$
$3^2+4^2+12^2=13^2$

$4^2+5^2+20^2=21^2$
$5^2+6^2+30^2=31^2$
$6^2+7^2+42^2=43^2$

Ex 5.1 Question 7.

Without adding, find the sum:
(i) $1+3+5+7+9$
(ii) $1+3+5+7+9+11+13+15+17+19$
(iii) $1+3+5+7+9+11+13+15+17+19+21+23$

Answer.

(i) Here, there are five odd numbers. Therefore square of 5 is 25 .
$\therefore 1+3+5+7+9=5^2=25$
(ii) Here, there are ten odd numbers. Therefore square of 10 is 100 .
$\therefore 1+3+5+7+9+11+13+15+17+19=10^2=100$
(iii) Here, there are twelve odd numbers. Therefore square of 12 is 144.
$\therefore 1+3+5+7+9+11+13+15+17+19+21+23=12^2=144$

Ex 5.1 Question 8.

(i) Express 49 as the sum of 7 odd numbers.
(ii) Express 121 as the sum of 11 odd numbers.

Answer.

(i) 49 is the square of 7 . Therefore it is the sum of 7 odd numbers.
$49=1+3+5+7+9+11+13$
(ii) 121 is the square of 11 . Therefore it is the sum of 11 odd numbers
$121=1+3+5+7+9+11+13+15+17+19+21$

Ex 5.1 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) Since, non-perfect square numbers between n^2 and $(n+1)^2$ are $2n$
Here, $n=12$
Therefore, non-perfect square numbers between 12 and $13=2n=2\times 12=24$
$(\text{i.e } 13^2-12^2-1=169-144-1=25-1=24)$
(ii) Since, non-perfect square numbers between n^2 and $(n+1)^2$ are $2n$

Here, $n=25$

Therefore, non-perfect square numbers between 25 and $26=2n=2\times 25=50$
$(\text{i.e } 26^2-25^2-1=676-625-1=51-1=50)$
(iii) Since, non-perfect square numbers between n^2 and $(n+1)^2$ are $2n$.

Here, $n=99$
Therefore, non-perfect square numbers between 99 and $100=2n=2\times 99=198$

$(\text{i.e } 100^2-99^2-1=10000-9801-1=199-1=198)$

Exercise 5.2 (Revised) - Chapter 6 - Square & Square Roots - Ncert Solutions class 8 - Maths

Updated On 11-02-2025 By Lithanya

Chapter 5 - Square & Square Roots - NCERT Solutions Class 8 Maths | Expert Solutions

Ex 5.2 Question 1.

Find the squares of the following numbers:

(i) 32

(ii) 35

(iii) 86

(iv) 93

(v) 71

(vi) 46

Answer.

(i) $(32)^2 = (30+2)^2 = (30)^2 + 2 \times 30 \times 2 + (2)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 900 + 120 + 4 = 1024$

(ii) $(35)^2 = (30+5)^2 = (30)^2 + 2 \times 30 \times 5 + (5)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 900 + 300 + 25 = 1225$

(iii) $(86)^2 = (80+6)^2 = (80)^2 + 2 \times 80 \times 6 + (6)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 6400 + 960 + 36 = 7396$

(iv) $(93)^2 = (90+3)^2 = (90)^2 + 2 \times 90 \times 3 + (3)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 8100 + 540 + 9 = 8649$

(v) $(71)^2 = (70+1)^2 = (70)^2 + 2 \times 70 \times 1 + (1)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 4900 + 140 + 1 = 5041$

(vi) $(46)^2 = (40+6)^2 = (40)^2 + 2 \times 40 \times 6 + (6)^2$

$[\because (a+b)^2 = a^2 + 2ab + b^2]$

$= 1600 + 480 + 36 = 2116$

Ex 5.2 Question 2.

Write a Pythagoras triplet whose one member is:

(i) 6

(ii) 14

(iii) 16

(iv) 18

Answer.

(i) There are three numbers $2m, m^2-1$ and m^2+1 in a Pythagorean Triplet. Here, $2m=6 \Rightarrow m=\frac{6}{2}=3$ Therefore, Second number $\left(m^2-1\right)=(3)^2-1=9-1=8$ Third number $m^2+1=(3)^2+1=9+1=10$

Hence, Pythagorean triplet is $(6,8,10)$.
(ii) There are three numbers $2m=m^2-1$ and m^2+1 in a Pythagorean Triplet. Here, $2m=14 \Rightarrow m=\frac{14}{2}=7$ Therefore, Second number $\left(m^2-1\right)=(7)^2-1=49-1=48$

Third number $m^2+1=(7)^2+1=49+1=50$
Hence, Pythagorean triplet is $(14,48,50)$.
(iii) There are three numbers $2m, m^2-1$ and m^2+1 in a Pythagorean Triplet.

Here, $2m=16 \Rightarrow m=\frac{16}{2}=8$
Therefore, Second number $\left(m^2-1\right)=(8)^2-1=64-1=63$
Third number $m^2+1=(8)^2+1=64+1=65$
Hence, Pythagorean triplet is $(16,63,65)$.
(iv) There are three numbers $2m_{=}m^2-1$ and m^2+1 in a Pythagorean Triplet.

Here, $2m=18 \Rightarrow m=\frac{18}{2}=9$
Therefore, Second number $\left(m^2-1\right)=(9)^2-1=81-1=80$
Third number $m^2+1=(9)^2+1=81+1=82$

Hence, Pythagorean triplet is $(18,80,82)$.

Chapter 5 - Square & Square Roots - NCERT Solutions Class 8 Maths | Expert Solutions

Ex 5.3 Question 1.

What could be the possible 'one's' digits of the square root of each of the following numbers:
(i) 9801
(ii) 99856
(iii) 998001
(iv) 657666025

Answer.

Since, Unit's digits of square of numbers are $0,1,4,5,6$ and 9. Therefore, the possible unit's digits of the given numbers are:
(i) 1 (ii) 6 (iii) 1 (iv) 5

Ex 5.3 Question 2.

Without doing any calculation, find the numbers which are surely not perfect squares:
(i) 153
(ii) 257
(iii) 408
(iv) 441

Answer.

Since, all perfect square numbers contain their unit's place digits $0,1,4,5,6$ and 9 .
(i) But given number 153 has its unit digit 3 . So it is not a perfect square number.
(ii) Given number 257 has its unit digit 7 . So it is not a perfect square number.
(iii) Given number 408 has its unit digit 8 . So it is not a perfect square number.
(iv) Given number 441 has its unit digit 1. So it would be a perfect square number

Ex 5.3 Question 3.

Find the square roots of 100 and 169 by the method of repeated subtraction.

Answer.

By successive subtracting odd natural numbers from 100,
$100-1=99$
$99-3=96$

$96-5=91$
$91-7=84$
$84-9=75$
$75-11=64$
$64-13=51$
$51-15=36$
$36-17=19$
$19-19=0$

This successive subtraction is completed in 10 steps.
Therefore $\sqrt{100}=10$
By successive subtracting odd natural numbers from 169,
$169-1=168$
$168-3=165$
$165-5=160$
$160-7=153$
$153-9=144$
$144-11=133$
$133-13=120$
$120-15=105$
$105-17=88$
$88-19=69$
$69-21=48$
$48-23=25$
$25-25=0$

This successive subtraction is completed in 13 steps.
Therefore $\sqrt{169}=13$

Ex 5.3 Question 4.

Find the square roots of the following numbers by the Prime Factorization method:
(i) 729
(ii) 400
(iii) 1764
(iv) 4096
(v) 7744
(vi) 9604
(vii) 5929
(viii) 9216
(ix) 529
(x) 8100

Answer.

(i) 729

3	729
3	243
3	81
3	27
3	9
3	3
	1

$\sqrt{729}=\sqrt{3\times3\times3\times3\times3\times3}$
$=3\times3\times3=27$
(ii) 400

2	400
2	200
2	100
2	50
5	25
5	5
	1

$\sqrt{400} = \sqrt{2 \times 2 \times 2 \times 2 \times 5 \times 5}$
$= 2 \times 2 \times 5 = 20$

(iii) 1764

2	1764
2	882
3	441
3	147
7	49
7	7
	1

$\sqrt{1764} = \sqrt{2 \times 2 \times 3 \times 3 \times 7 \times 7}$
$= 2 \times 3 \times 7 = 42$

(iv) 4096

2	4096
2	2048
2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$\sqrt{4096} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$
$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$

(v) 7744

2	7744
2	3872
2	1936
2	968
2	484
2	242
11	121
11	11
	1

$\sqrt{7744} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 11 \times 11}$
$= 2 \times 2 \times 2 \times 11 = 88$

(vi) 9604

2	9604
2	4802
7	2401
7	343
7	49
7	7
	1

$\sqrt{9604} = \sqrt{2 \times 2 \times 7 \times 7 \times 7 \times 7}$
$= 2 \times 7 \times 7 = 98$

(vii) 5929

11	121
11	11
	1

$\sqrt{5929}=\sqrt{7\times 7\times 11\times 11}$
$=7\times 11=77$

(viii) 9216

2	9216
2	4608
2	2304
2	1152
2	576
2	288
2	144
2	72
2	36
2	18
3	9
3	3
	1

$\sqrt{9216}=\sqrt{2\times 2\times 2\times 2\times 2\times 2\times 2\times 2\times 2\times 2\times 3\times 3}$
$=2\times 2\times 2\times 2\times 2\times 3=96$

(ix) 529

23	529
23	23
	1

$\sqrt{529}=\sqrt{23\times 23}=23$

(x) 8100

2	8100
2	4050
3	2025
3	675
3	225
3	75
5	25
5	5
	1

$\sqrt{8100}=\sqrt{2\times 2\times 3\times 3\times 3\times 3\times 5\times 5}$

$=2\times 3\times 3\times 5=90$

Ex 5.3 Question 5.

For each of the following numbers, find the smallest whole number by which it should be multiplied so as to get a perfect square number. Also, find the square root of the square number so obtained:
(i) 252
(ii) 180
(iii) 1008
(iv) 2028
(v) 1458
(vi) 768

Answer.

(i)

2	252
2	126
3	63
3	21
7	7
	1

$252 = 2 \times 2 \times 3 \times 3 \times 7$

Here, prime factor 7 has no pair. Therefore 252 must be multiplied by 7 to make it a perfect square.

$\therefore 252 \times 7 = 1764$

$\sqrt{1764} = 2 \times 3 \times 7 = 42$

(ii)

2	180
2	90
3	45
3	15
5	5
	1

$180 = 2 \times 2 \times 3 \times 3 \times 5$

Here, prime factor 5 has no pair. Therefore 180 must be multiplied by 5 to make it a perfect square.

$\therefore 180 \times 5 = 900$

$\sqrt{900} = 2 \times 3 \times 5 = 30$

(iii)

2	1008
2	504
2	252
2	126
3	63
3	21
7	7
	1

$1008 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$

Here, prime factor 7 has no pair. Therefore 1008 must be multiplied by 7 to make it a perfect square.

$\therefore 1008 \times 7 = 7056$

And $\sqrt{7056} = 2 \times 2 \times 3 \times 7 = 84$

(iv)

2	2028
2	1014
3	507
13	169
13	13
	1

$2028 = 2 \times 2 \times 3 \times 13 \times 13$

Here, prime factor 3 has no pair. Therefore 2028 must be multiplied by 3 to make it a perfect square.

2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

$1458 = 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$

Here, prime factor 2 has no pair. Therefore 1458 must be multiplied by 2 to make it a perfect square.
$\therefore 1458 \times 2 = 2916$

And $\sqrt{2916} = 2 \times 3 \times 3 \times 3 = 54$
(vi)

2	768
2	384
2	192
2	96
2	48
2	24
2	12
2	6
3	3
	1

$768 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$

Here, prime factor 3 has no pair. Therefore 768 must be multiplied by 3 to make it a perfect square.
$\therefore 768 \times 3 = 2304$

And $\sqrt{2304} = 2 \times 2 \times 2 \times 2 \times 3 = 48$

Ex 5.3 Question 6.

For each of the following numbers, find the smallest whole number by which it should be divided so as to get a perfect square. Also, find the square root of the square number so obtained:
(i) 252
(ii) 2925
(iii) 396
(iv) 2645
(v) 2800
(vi) 1620

Answer.

(i)

2	252
2	126
3	63
3	21
7	7
	1

$252 = 2 \times 2 \times 3 \times 3 \times 7$

Here, prime factor 7 has no pair. Therefore 252 must be divided by 7 to make it a perfect square.
$\therefore 252 \div 7 = 36$

And $\sqrt{36} = 2 \times 3 = 6$
(ii)

3	2925
3	975
5	325
5	65
13	13
	1

$2925 = 3 \times 3 \times 5 \times 5 \times 13$

Here, prime factor 13 has no pair. Therefore 2925 must be divided by 13 to make it a perfect square.
$\therefore 2925 \div 13 = 225$

And $\sqrt{225} = 3 \times 5 = 15$
(iii)

2	396
2	198
3	99
3	33
11	11
	1

$396 = 2 \times 2 \times 3 \times 3 \times 11$

Here, prime factor 11 has no pair. Therefore 396 must be divided by 11 to make it a perfect square.

$\therefore 396 \div 11 = 36$

And $\sqrt{36} = 2 \times 3 = 6$

(iv)

5	2645
23	529
23	23
	1

$2645 = 5 \times 23 \times 23$

Here, prime factor 5 has no pair. Therefore 2645 must be divided by 5 to make it a perfect square.

$\therefore 2645 \div 5 = 529$

And $\sqrt{529} = 23 \times 23 = 23$

(v)

2	2800
2	1400
2	700
2	350
5	175
5	35
7	7
	1

$2800 = 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 7$

Here, prime factor 7 has no pair. Therefore 2800 must be divided by 7 to make it a perfect square.

$\therefore 2800 \div 7 = 400$

And $\sqrt{400} = 2 \times 2 \times 5 = 20$

(vi)

2	1620
2	810
3	405
3	135
3	45
3	15
5	5
	1

$1620 = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5$

Here, prime factor 5 has no pair. Therefore 1620 must be divided by 5 to make it a perfect square.

$\therefore 1620 \div 5 = 324$

And $\sqrt{324} = 2 \times 3 \times 3 = 18$

Ex 5.3 Question 7.

The students of Class VIII of a school donated Rs. 2401 in all, for Prime Minister's National Relief Fund. Each student donated as many rupees as the number of students in the class. Find the number of students in the class.

Answer.

Here, Donated money = Rs 2401
Let the number of students be x.
Therefore donated money $= x \times x$

According to question,
$x^2 = 2401$

7	2401
7	343
7	49
7	7
	1

$\Rightarrow x = \sqrt{2401} = \sqrt{7 \times 7 \times 7 \times 7}$
$\Rightarrow x = 7 \times 7 = 49$

Hence, the number of students is 49 .

Ex 5.3 Question 8.

2025 plants are to be planted in a garden in such a way that each row contains as many plants as the number of rows. Find the number of rows and the number of plants in each row.

Answer.

Here, Number of plants $= 2025$

Let the number of rows of planted plants be x.
And each row contains number of plants $= x$
According to question,
$x^2 = 2025$

3	2025
3	675
3	225
3	75
5	25
5	5
	1

$\Rightarrow x = \sqrt{2025} = \sqrt{3 \times 3 \times 3 \times 3 \times 5 \times 5}$
$\Rightarrow x = 3 \times 3 \times 5 = 45$

Hence, each row contains 45 plants.

Ex 5.3 Question 9.

Find the smallest square number that is divisible by each of the numbers 4,9 and 10 .

Answer.

L.C.M. of 4, 9 and 10 is 180 .

2	180
2	90
3	45
3	15
5	5
	1

Prime factors of $180 = 2 \times 2 \times 3 \times 3 \times 5$
Here, prime factor 5 has no pair. Therefore 180 must be multiplied by 5 to make it a perfect square.
$\therefore 180 \times 5 = 900$

Hence, the smallest square number which is divisible by 4,9 and 10 is 900 .

Ex 5.3 Question 10.

Find the smallest square number that is divisible by each of the numbers 8,15 and 20.

Answer.

L.C.M. of 8,15 and 20 is 120 .

2	120
2	60
3	30
3	15
5	5
	1

Prime factors of $120=2\times2\times2\times3\times5$
Here, prime factor 2,3 and 5 has no pair. Therefore 120 must be multiplied by $2\times3\times5$ to make it a perfect square.
$\therefore 120\times2\times3\times5=3600$

Hence, the smallest square number which is divisible by 8,15 and 20 is 3600 .

Exercise 5.4 (Revised) - Chapter 6 - Square & Square Roots - Ncert Solutions class 8 - Maths

Updated On 11-02-2025 By Lithanya

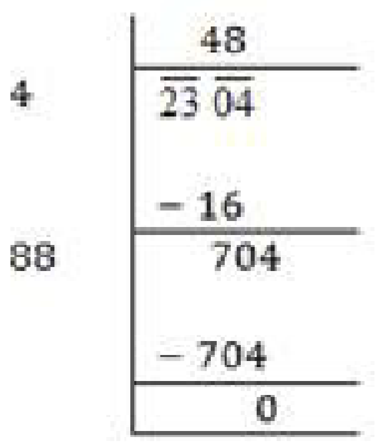
Chapter 5 - Square & Square Roots - NCERT Solutions Class 8 Maths | Expert Solutions

Ex 5.4 Question 1.

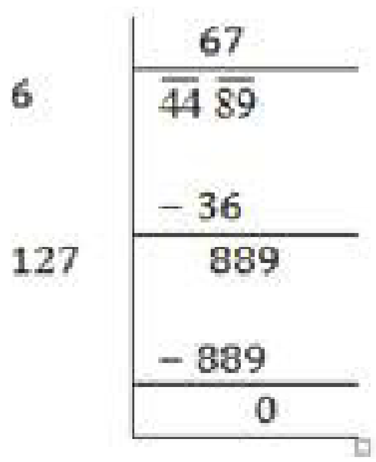
Find the square roots of each of the following numbers by Division method:
(i) 2304
(ii) 4489
(iii) 3481
(iv) 529
(v) 3249
(vi) 1369

Answer.

(i) 2304



Hence, the square root of 2304 is 48 .
(ii) 4489



Hence, the square root of 4489 is 67 .
(iii) 3481

	59
5	$\overline{34}\ \overline{81}$
	-25
109	981
	-981
	0

Hence, the square root of 3481 is 59.

(iv) 529

	23
2	$\overline{5}\ \overline{29}$
	-4
43	129
	-129
	0

Hence, the square root of 529 is 23 .

(v) 3249

	57
5	$\overline{32}\ \overline{49}$
	-25
107	749
	-749
	0

Hence, the square root of 3249 is 57.

(vi) 1369

	37
3	$\overline{13}\ \overline{69}$
	-9
67	469
	-469
	0

Hence, the square root of 1369 is 37 .

(vii) 5776

	76
7	$\overline{57}\ \overline{76}$
	-49
146	876
	-876
	0

Hence, the square root of 5776 is 76 .

(viii) 7921

$$\begin{array}{l|l} & 89 \\ \hline 8 & \overline{79}\ \overline{21} \\ & -64 \\ \hline 169 & 1521 \\ & -1521 \\ \hline & 0 \end{array}$$

Hence, the square root of 7921 is 89 .
(ix) 576

$$\begin{array}{l|l} & 24 \\ \hline 2 & \overline{5}\ \overline{76} \\ & -4 \\ \hline 44 & 176 \\ & -176 \\ \hline & 0 \end{array}$$

Hence, the square root of 576 is 24 .
(x) 1024

$$\begin{array}{l|l} & 32 \\ \hline 3 & \overline{10}\ \overline{24} \\ & -9 \\ \hline 62 & 124 \\ & -124 \\ \hline & 0 \end{array}$$

Hence, the square root of 1024 is 32 .
(xi) 3136

$$\begin{array}{l|l} & 56 \\ \hline 5 & \overline{31}\ \overline{36} \\ & -25 \\ \hline 106 & 636 \\ & -636 \\ \hline & 0 \end{array}$$

Hence, the square root of 3136 is 56 .
(xii) 900

$$\begin{array}{l|l} & 30 \\ \hline 3 & \overline{9}\ \overline{00} \\ & -9 \\ \hline 00 & 000 \\ & -000 \\ \hline & 0 \end{array}$$

Hence, the square root of 900 is 30 .
Ex 5.4 Question 2.

Find the number of digits in the square root of each of the following numbers (without any calculation):
(i) 64
(ii) 144 (iii) 4489
(iv) 27225
(v) 390625

Answer.

(i) Here, 64 contains two digits which is even.
Therefore, number of digits in square root $= \frac{n}{2} = \frac{2}{2} = 1$ (that is 8 , which is single digit number)
(ii) Here, 144 contains three digits which is odd.

Therefore, number of digits in square root $= \frac{n+1}{2} = \frac{3+1}{2} = \frac{4}{2} = 2$ (that is 12 , which is a 2digit number)
(iii) Here, 4489 contains four digits which is even.

Therefore, number of digits in square root $= \frac{n}{2} = \frac{4}{2} = 2$ (that is 67 , which is a 2-digit number)

(iv) Here, 27225 contains five digits which is odd.

Therefore, number of digits in square root $= \frac{n}{2} = \frac{5+1}{2} = 3$ (that is 165 , which is a 3-digit number)

(v) Here, 390625 contains six digits which is even.

Therefore, the number of digits in square root $= \frac{n}{2} = \frac{6}{2} = 3$ (that is 625 , which is a 3-digit number)
Ex 5.4 Question 3.

Find the square root of the following decimal numbers:
(i) 2.56
(ii) 7.29
(iii) 51.84
(iv) 42.25
(v) 31.36

Answer.

(i) 2.56

	1.6
1	$\overline{2}.\overline{56}$
	−1
26	156
	−156
	0

Hence, the square root of 2.56 is 1.6 .
(ii) 7.29

	2.7
2	$\overline{7}.\overline{29}$
	−4
47	329
	−329
	0

Hence, the square root of 7.29 is 2.7 .
(iii) 51.84

	7.2
7	$\overline{51}.\overline{84}$
	−49
142	284
	−284
	0

Hence, the square root of 51.84 is 7.2 .

(iv) 42.25

	6.5
6	$\overline{42}.\overline{25}$
	− 36
125	625
	− 625
	0

Hence, the square root of 42.25 is 6.5.

(v) 31.36

	5.6
5	$\overline{31}.\overline{36}$
	− 25
106	636
	− 636
	0

Hence, the square root of 31.36 is 5.6.

Ex 5.4 Question 4.

Find the least number which must be subtracted from each of the following numbers so as to get a perfect square. Also, find the square root of the perfect square so obtained:

(i) 402
(ii) 1989
(iii) 3250
(iv) 825
(v) 4000

Answer.

(i) 402

We know that, if we subtract the remainder from the number, we get a perfect square.
Here, we get remainder 2. Therefore 2 must be subtracted from 402 to get a perfect square.

	20
2	$\overline{4}\,\overline{02}$
	− 4
40	02
	− 00
	2

$\therefore 402-2=400$

Hence, the square root of 400 is 20 .

	20
2	$\overline{4}\,\overline{00}$
	− 4
00	00
	− 00
	0

(ii) 1989

We know that, if we subtract the remainder from the number, we get a perfect square.

$$\begin{array}{r|r}
 & 44 \\ \hline
4 & \overline{19}\ \overline{89} \\
 & -16 \\ \hline
84 & 389 \\
 & -336 \\ \hline
 & 53
\end{array}$$

Here, we get remainder 53. Therefore 53 must be subtracted from 1989 to get a perfect square.
$\therefore 1989-53=1936$

Hence, the square root of 1936 is 44 .

$$\begin{array}{r|r}
 & 44 \\ \hline
4 & \overline{19}\ \overline{36} \\
 & -16 \\ \hline
84 & 336 \\
 & -336 \\ \hline
 & 0
\end{array}$$

(iii) 3250

We know that, if we subtract the remainder from the number, we get a perfect square.

$$\begin{array}{r|r}
 & 57 \\ \hline
5 & \overline{32}\ \overline{50} \\
 & -25 \\ \hline
107 & 750 \\
 & -749 \\ \hline
 & 1
\end{array}$$

Here, we get remainder 1 . Therefore 1 must be subtracted from 3250 to get a perfect square.
$\therefore 3250-1=3249$

Hence, the square root of 3249 is 57.

$$\begin{array}{r|r}
 & 57 \\ \hline
5 & \overline{32}\ \overline{49} \\
 & -25 \\ \hline
107 & 749 \\
 & -749 \\ \hline
 & 0
\end{array}$$

(iv) 825

We know that, if we subtract the remainder from the number, we get a perfect square.

$$\begin{array}{r|r}
 & 28 \\ \hline
2 & \overline{8}\ \overline{25} \\
 & -4 \\ \hline
48 & 425 \\
 & -384 \\ \hline
 & 41
\end{array}$$

Here, we get remainder 41 . Therefore 41 must be subtracted from 825 to get a perfect square.
$\therefore 825-41=784$

Hence, the square root of 784 is 28 .

	28
2	$\overline{7}\ \overline{84}$
	-4
48	384
	-384
	0

(v) 4000

We know that, if we subtract the remainder from the number, we get a perfect square.

	63
6	$\overline{40}\ \overline{00}$
	-36
123	400
	-369
	31

Here, we get remainder 31. Therefore 31 must be subtracted from 4000 to get a perfect square.
$\therefore 4000-31=3969$

Hence, the square root of 3969 is 63 .

	63
6	$\overline{39}\ \overline{69}$
	-36
123	369
	-369
	0

Ex 5.4 Question 5.

Find the least number which must be added to each of the following numbers so as to get a perfect square. Also, find the square root of the perfect square so obtained:
(i) 525
(ii) 1750
(iii) 252
(iv) 1825 (v) 6412

Answer.

(i) 525

	22
2	$\overline{5}\ \overline{25}$
	-4
42	125
	-84
	41

Since the remainder is 41 .

Therefore $22^2<525$

Next perfect square number $23^2=529$

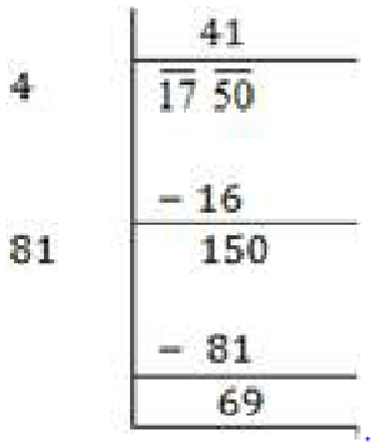
Hence, number to be added

$= 529 - 525 = 4$

$\therefore 525 + 4 = 529$

Hence, the square root of 529 is 23 .

(ii) 1750



Since the remainder is 69 .

Therefore $41^2 < 1750$

Next perfect square number $42^2 = 1764$

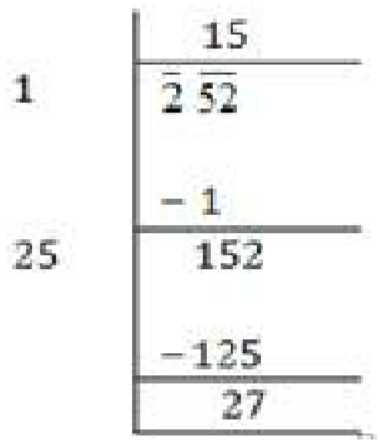
Hence, number to be added

$= 1764 - 1750 = 14$

$\therefore 1750 + 14 = 1764$

Hence, the square root of 1764 is 42 .

(iii) 252



Since the remainder is 27 .

Therefore $15^2 < 252$

Next perfect square number $16^2 = 256$

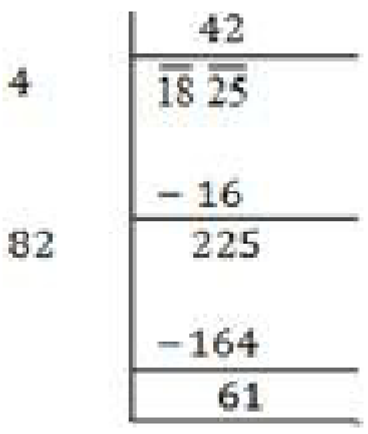
Hence, number to be added

$= 256 - 252 = 4$

$\therefore 252 + 4 = 256$

Hence, the square root of 256 is 16 .

(iv) 1825



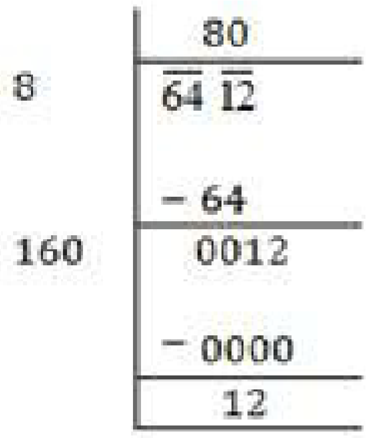
Since the remainder is 61 .

Therefore $42^2 < 1825$

Next perfect square number $43^2 = 1849$

Hence, number to be added $= 1849 - 1825 = 24$

$\therefore 1825 + 24 = 1849$



Since the remainder is 12 .

Therefore $80^2 < 6412$
Next perfect square number $81^2 = 6561$
Hence, number to be added
$= 6561 - 6412 = 149$
$\therefore 6412 + 149 = 6561$

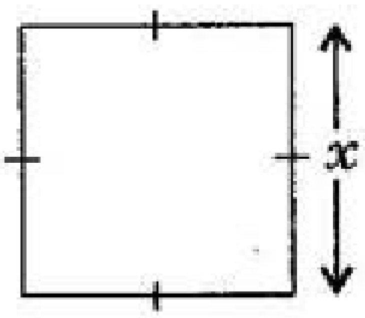
Hence, the square root of 6561 is 81 .
Ex 5.4 Question 6.

Find the length of the side of a square whose area is $441 \mathrm{~m}^2$?

Answer.

Let the length of the side of a square be x meter.
Area of square $= (\text{ side })^2 = x^2$

According to question,



$x^2 = 441$

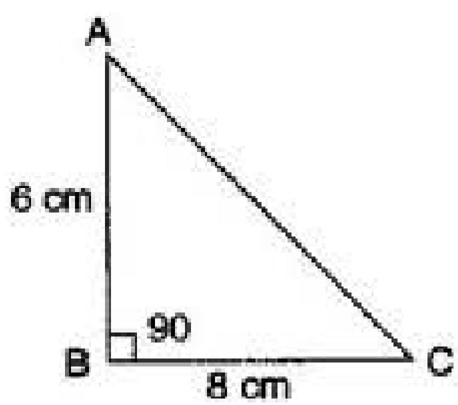
$\Rightarrow x = \sqrt{441} = \sqrt{3 \times 3 \times 7 \times 7}$
$= 3 \times 7$
$\Rightarrow x = 21 \mathrm{~m}$

Hence, the length of the side of a square is $21 \mathrm{~m}$.
Ex 5.4 Question 7.

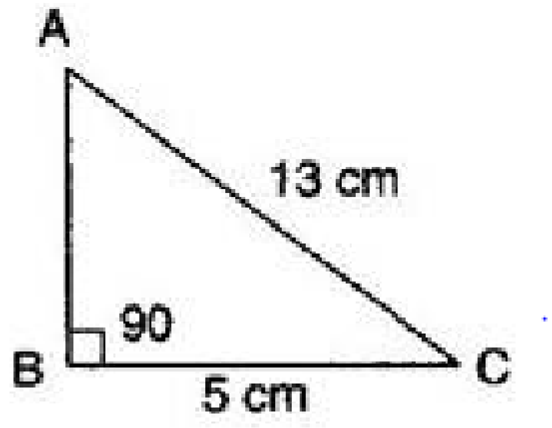
In a right triangle $\mathrm{ABC}, \angle \mathrm{B} = 90^{\circ}$.
(i) If $\mathrm{AB} = 6 \mathrm{~cm}, \mathrm{BC} = 8 \mathrm{~cm}$, find AC.
(ii) If $\mathrm{AC} = 13 \mathrm{~cm}, \mathrm{BC} = 5 \mathrm{~cm}$, find AB.

Answer.

(i) Using Pythagoras theorem,



$AC^2 = AB^2 + BC^2$
$\Rightarrow AC^2 = (6)^2 + (8)^2$
$\Rightarrow AC^2 = 36 + 84 = 100$
$\Rightarrow \mathrm{AC} = \mathrm{sqrt}(100)$
$\Rightarrow \mathrm{AC} = 10 \mathrm{~cm}$
(ii) Using Pythagoras theorem,



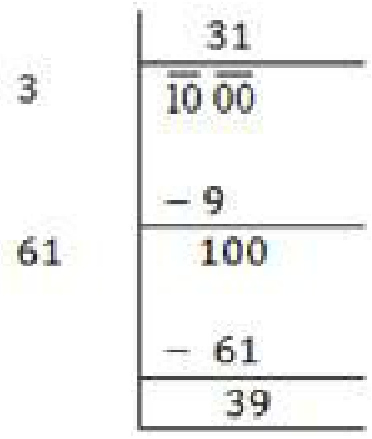
$AC^2 = AB^2 + BC^2$
$\Rightarrow (13)^2 = AB^2 + (5)^2$
$\Rightarrow 169 = AB^2 + 25$
$\Rightarrow AB^2 = 169 - 25$
$\Rightarrow AB^2 = 144$
$\Rightarrow \mathrm{AB} = \mathrm{sqrt}(144)$
$\Rightarrow \mathrm{AB} = 12 \mathrm{~cm}$

Ex 5.4 Question 8.

A gardener has $\mathbf{1000}$ plants. He wants to plant these in such a way that the number of rows and number of columns remain same. Find the minimum number of plants he needs more for this.

Answer.

Here, plants $= 1000$



Since remainder is 39.

Therefore $31^2 < 1000$
Next perfect square number $32^2 = 1024$
Hence, number to be added
$= 1024 - 1000 = 24$
$\therefore 1000 + 24 = 1024$

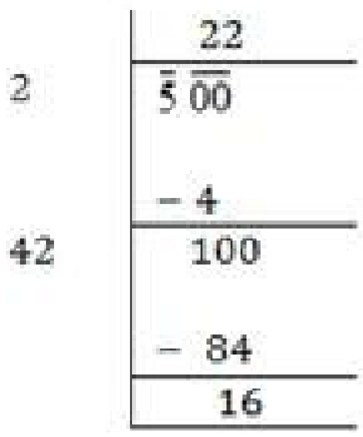
Hence, the gardener requires 24 more plants.

Ex 5.4 Question 9.

There are 500 children in a school. For a P.T. drill, they have to stand in such a manner that the number of rows is equal to the number of columns. How many children would be left out in this arrangement?

Answer.

Here, Number of children $= 500$



By getting the square root of this number, we get, In each row, the number of children is 22 .

And left out children are 16.