Exercise 6.4

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
(vii) 5776
(viii) 7921
(ix) 576
(x) 1024
(xi) 3136
(xii) 900

Answer 1:

(i) 2304

Hence, the square root of 2304 is 48.

	48
4	$\overline{23}\ \overline{04}$ − 16
88	704 − 704
	0

(ii) 4489

Hence, the square root of 4489 is 67.

	67
6	$\overline{44}\ \overline{89}$ − 36
127	889 − 889
	0

(iii) 3481

Hence, the square root of 3481 is 59.

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

(iv) 529

Hence, the square root of 529 is 23.

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

(v) 3249

Hence, the square root of 3249 is 57.

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

(vi) 1369

Hence, the square root of 1369 is 37.

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

(vii) 5776

Hence, the square root of 5776 is 76.

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

(viii) 7921

Hence, the square root of 7921 is 89.

	89
8	$\overline{79}\ \overline{21}$ − 64
169	1521 − 1521
	0

(ix) 576

Hence, the square root of 576 is 24.

	24
2	$\overline{5}\ \overline{76}$ − 4
44	176 −176
	0

(x) 1024

Hence, the square root of 1024 is 32.

	32
3	$\overline{10}\ \overline{24}$ − 9
62	124 − 124
	0

(xi) 3136

Hence, the square root of 3136 is 56.

	56
5	$\overline{31}\ \overline{36}$ − 25
106	636 − 636
	0

(xii) 900

Hence, the square root of 900 is 30.

	30
3	$\overline{9}\ \overline{00}$ − 9
00	000 − 000
	0

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 2:

(i) Here, 64 contains two digits which is even.

Therefore, number of digits in square root = $\frac{n}{2}=\frac{2}{2}=1$

(ii) Here, 144 contains three digits which is odd.

Therefore, number of digits in square root = $\frac{n+1}{2}=\frac{3+1}{2}=\frac{4}{2}=2$

(iv) Here, 4489 contains four digits which is even.

Therefore, number of digits in square root = $\frac{n}{2}=\frac{4}{2}=2$

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

Therefore, number of digits in square root = $\frac{n}{2}=\frac{6}{2}=3$

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 3:

(i) 2.56

Hence, the square root of 2.56 is 1.6.

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

(ii) 7.29

Hence, the square root of 7.29 is 2.7.

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

(iii) 51.84

Hence, the square root of 51.84 is 7.2.

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

(iv) 42.25

Hence, the square root of 42.25 is 6.5.

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

(v) 31.36

Hence, the square root of 31.36 is 5.6.

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

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 4:

(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.
∴ 402 – 2 = 400

	20
2	$\overline{4}\ \overline{02}$ – 4
40	02 – 00
	2

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.
Here, we get remainder 53. Therefore 53 must be subtracted from 1989 to get a perfect square.
∴ 1989 – 53 = 1936

Hence, the square root of 1936 is 44.

	44
4	$\overline{19}\ \overline{36}$ – 16
84	336 – 336
	0

	44
4	$\overline{19}\ \overline{89}$ – 16
84	389 – 336
	53

(iii) 3250

We know that, if we subtract the remainder from the number, we get a perfect square.
Here, we get remainder 1. Therefore 1 must be subtracted from 3250 to get a perfect square.
∴ 3250 – 1 = 3249

Hence, the square root of 3249 is 57.

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

	57
5	$\overline{32}\ \overline{50}$ – 25
107	750 – 749
	1

(iv) 825

We know that, if we subtract the remainder from the number, we get a perfect square.
Here, we get remainder 41. Therefore 41 must be subtracted from 825 to get a perfect square.
∴ 825 – 41 = 784

Hence, the square root of 784 is 28.

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

	28
2	$\overline{8}\ \overline{25}$ – 4
48	425 – 384
	41

(v) 4000

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

Here, we get remainder 31. Therefore 31 must be subtracted from 4000 to get a perfect square.

∴ 4000 – 31 = 3969

Hence, the square root of 3969 is 63.

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

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

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 5:

(i) 525

Since remainder is 41. Therefore $22^2 < 525$

Next perfect square number $23^2 = 529$

Hence, number to be added = 529 – 525 = 4

∴ 525 + 4 = 529

Hence, the square root of 529 is 23.

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

(ii) 1750

Since remainder is 69. Therefore $41^2 < 1750$

Next perfect square number $42^2 = 1764$

Hence, number to be added = 1764 – 1750 = 14

∴ 1750 + 14 = 1764

Hence, the square root of 1764 is 42.

	41
4	$\overline{17}\ \overline{50}$ – 16
81	150 – 81
	69

(iii) 252

Since remainder is 27. Therefore $15^2 < 252$

Next perfect square number $16^2 = 256$

Hence, number to be added = 256 – 252 = 4

∴ 252 + 4 = 256

Hence, the square root of 256 is 16.

	15
1	$\overline{2}\ \overline{52}$ – 1
25	152 –125
	27

(iv) 1825

Since 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

Hence, the square root of 1849 is 43.

	42
4	$\overline{18}\ \overline{25}$ − 16
82	225 −164
	61

(v) 6412

Since 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.

	80
8	$\overline{64}\ \overline{12}$ − 64
160	0012 − 0000
	12

Question 6:

Find the length of the side of a square whose area is 441 m^2?

Answer 6:

Let the length of side of a square be x meter.

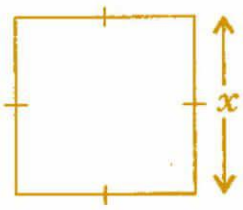
Area of square = $(\text{side})^2 = x^2$

According to question, $x^2 = 441$

$\Rightarrow$ $x = \sqrt{441} = \sqrt{3\times3\times7\times7} = 3 \times 7$

$\Rightarrow$ $x = 21$ m

Hence, the length of side of a square is 21 m.



Question 7:

In a right triangle ABC, $\angle B = 90^\circ$.

(i) If AB = 6 cm, BC = 8 cm, find AC.

(ii) If AC = 13 cm, BC = 5 cm, find AB.

Answer 7:

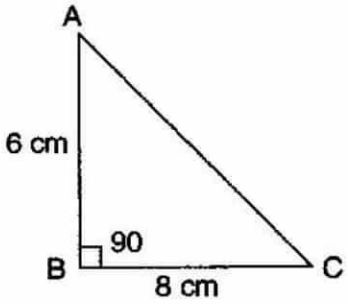
(i) Using Pythagoras theorem,

$AC^2 = AB^2 + BC^2$

$\Rightarrow$ $AC^2 = (6)^2 + (8)^2$

$\Rightarrow$ $AC^2 = 36 + 84 = 100$

$\Rightarrow$ AC = 10 cm



(ii) Using Pythagoras theorem,

$AC^2 = AB^2 + BC^2$

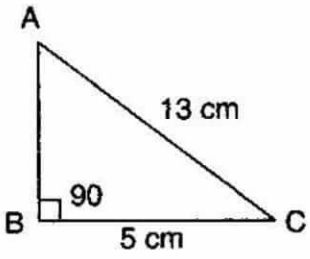
$\Rightarrow$ $(13)^2 = AB^2 + (5)^2$

$\Rightarrow$ $169 = AB^2 + 25$

$\Rightarrow$ $AB^2 = 169 - 25$

$\Rightarrow$ $AB^2 = 144$

$\Rightarrow$ AB = 12 cm



Question 8:

A gardener has 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 8:

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 required 24 more plants.

	31
3	$\overline{10}\ \overline{00}$
	− 9
61	100
	− 61
	39

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 number of columns. How many children would be left out in this arrangement?

Answer 9:

Here, Number of children = 500

By getting the square root of this number, we get,

	22
2	$\bar{5}\ \overline{00}$
	− 4
42	100
	− 84
	16

In each row, the number of children is 22.

And left out children are 16.