$\Rightarrow x^2 = (3\times3\times5)\times(3\times3\times5)$
$\Rightarrow x^2 = 45\times45$
$\Rightarrow x = \sqrt{45\times45}$
$\Rightarrow x = 45$
$\therefore$ The number of rows = 45 and the number of plants in each rows = 45.

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

2	4, 9, 10
	2, 9, 5

L.C.M of 4, 9 and 10 is $(2\times2\times9\times5)$ 180.
$180 = 2\times2\times9\times5$
$= (2\times2)\times3\times3\times5$
$= (2\times2)\times(3\times3)\times5$
Here, 5 cannot be paired.
$\therefore$ we will multiply 180 by 5 to get perfect square.
Hence, the smallest square number divisible by 4, 9 and 10 = $180\times5 = 900$

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

2	8, 15, 20
2	4, 15, 10
5	2, 15, 5
	2, 3, 1

L.C.M of 8, 15 and 20 is $(2\times2\times5\times2\times3)$ 120.
$120 = 2\times2\times3\times5\times2$
$= (2\times2)\times3\times5\times2$
Here, 3, 5 and 2 cannot be paired.
$\therefore$ We will multiply 120 by $(3\times5\times2)$ 30 to get perfect square.
Hence, the smallest square number divisible by 8, 15 and 20 $=120\times30 = 3600$

EXERCISE 6.4 PAGE: 107

1. Find the square root 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

Solution:

i.

	48
4	$\overline{23}\,\overline{04}$
+ 4	16
88	704
+8	704
96	0

$\therefore \sqrt{2304} = 48$

ii.

	67
6	$\overline{44}\,\overline{89}$
+ 6	36
127	889
+7	889
134	0

$\therefore \sqrt{4489} = 67$

iii.

	59
5	$\overline{34}\,\overline{81}$
+5	25
109	981
+9	981
118	0

$\therefore \sqrt{3481} = 59$

iv.

	23
2	$\overline{5}\,\overline{29}$
+2	4
43	129
+3	129
46	0

$\therefore \sqrt{529} = 23$

v.

	57
5	$\overline{32}\,\overline{49}$
+ 5	25
107	749
+7	749
114	0

$\therefore \sqrt{3249} = 57$

vi.

	37
3	$\overline{13}\,\overline{69}$
+3	9
67	469
+7	469
74	0

$\therefore \sqrt{1369} = 37$

vii.

	76
7	$\overline{57}\,\overline{76}$
+7	49
146	876
+6	876
152	0

$\therefore \sqrt{5776} = 76$

viii.

	89
8	$\overline{79}\,\overline{21}$
+8	64
169	1521
+9	1521
178	0

$\therefore \sqrt{7921} = 89$

ix.

	24
2	$\overline{5}\,\overline{76}$
+2	4
44	176
+4	176
48	0

$\therefore \sqrt{576} = 24$

x.

	32
3	$\overline{10}\,\overline{24}$
+3	9
62	124
+2	124
64	0

$\therefore \sqrt{1024} = 32$

xi.

	56
5	$\overline{31}\,\overline{36}$
+5	25
106	636
+6	636
112	0

$\therefore \sqrt{3136} = 56$

xii.

	30
3	$9\overline{00}$
+3	9
60	00

$\therefore \sqrt{900} = 30$

2. Find the number of digits in the square root of each of the following numbers (without any calculation).64

i. 144

ii. 4489

iii. 27225

iv. 390625

Solution:

i.

	12
1	$1\overline{44}$
+1	1
22	44
+2	44
24	0

$\therefore \sqrt{144} = 12$

Hence, the square root of the number 144 has 2 digits.

ii.

	67
6	$\overline{44}\,\overline{89}$
+6	36
127	889
+7	889
134	0

$\therefore \sqrt{4489} = 67$

Hence, the square root of the number 4489 has 2 digits.

iii.

	165
1	$\overline{2}\,\overline{72}\,\overline{25}$
+1	1
26	172
+6	156
325	1625
+5	1625
350	0

$\sqrt{27225} = 165$

Hence, the square root of the number 27225 has 3 digits.

iv.

	625
6	$\overline{39}\,\overline{06}\,\overline{25}$
+6	36
122	306
+ 2	244
1245	6225
+5	6225
1250	0

∴ √390625 = 625
Hence, the square root of the number 390625 has 3 digits.

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
Solution:
i.

	1.6
1	2.$\overline{56}$
+1	1
26	156
+6	156
32	0

∴ √2.56 = 1.6

ii.

	2.7
2	7.$\overline{29}$
+2	4
47	329
+7	329
54	0

∴ √7.29 = 2.7

iii.

	7.2
7	$\overline{51}.\overline{84}$
+7	49
142	284
+2	284
144	0

$\therefore \sqrt{51.84} = 7.2$

iv.

	6.5
6	$\overline{42}.\overline{25}$
+6	36
125	625
+5	625
130	0

$\therefore \sqrt{42.25} = 6.5$

v.

	5.6
5	$\overline{31}.\overline{36}$
+5	25
106	636
+6	636
112	0

$\therefore \sqrt{31.36} = 5.6$

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

Solution:

i.

	2
2	$4\overline{02}$
+2	4
4	02

$\therefore \sqrt{400} = 20$

$\therefore$ We must subtracted 2 from 402 to get a perfect square.
New number = 402 – 2 = 400

	20
2	$4\overline{00}$
+2	4
40	00

$\therefore \sqrt{400} = 20$

ii.

	44
4	$\overline{19}\,\overline{89}$
+4	16
84	389
+4	336
88	53

$\therefore$ We must subtracted 53 from 1989 to get a perfect square. New number = 1989 – 53 = 1936

	44
4	$\overline{19}\,\overline{36}$
+4	16
84	336
+4	336
88	0

$\therefore \sqrt{1936} = 44$

iii.

	57
5	$\overline{32}\,\overline{50}$
+ 5	25
107	750
+7	749
114	1

$\therefore$ We must subtracted 1 from 3250 to get a perfect square.
New number = 3250 – 1 = 3249

	57
5	$\overline{32}\,\overline{49}$
+ 5	25
107	749
+7	749
114	0

$\therefore \sqrt{3249} = 57$

iv.

	28
2	825
+2	4
48	425
+8	384
56	41

∴ We must subtracted 41 from 825 to get a perfect square.
New number = 825 – 41 = 784

	28
2	784
+2	4
48	384
+8	384
56	0

∴ $\sqrt{784} = 28$

	63
6	4000
+6	36
123	400
+3	369
126	31

∴ We must subtracted 31 from 4000 to get a perfect square. New number = 4000 – 31 = 3969
∴ $\sqrt{3969} = 63$

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

Solution:
(i)

	22
2	525
+2	4
42	125
+2	84
44	41

	23
2	525
+2	4
43	125
+3	129

Here, $(22)^2 < 525 > (23)^2$
We can say 525 is (129 – 125) 4 less than $(23)^2$.
∴ If we add 4 to 525, it will be perfect square. New number = 525 + 4 = 529

	23
2	$5\overline{29}$
+2	4
43	129
+3	129
46	0

$\therefore \sqrt{529} = 23$

(ii)

	41
4	$\overline{17}\,\overline{50}$
+4	16
81	150
+1	81
82	69

	42
4	$\overline{17}\,\overline{50}$
4	16
82	150
+2	164

Here, $(41)^2 < 1750 > (42)^2$

We can say 1750 is (164 – 150) 14 less than $(42)^2$.

$\therefore$ If we add 14 to 1750, it will be perfect square.

New number $= 1750 + 14 = 1764$

	42
4	1764
4	16
82	164
+2	164

$\therefore \sqrt{1764} = 42$

(iii)

	15
1	252
+1	1
25	152
+5	125
30	27

	16
1	252
+1	1
26	152
+6	156

Here, $(15)^2 < 252 > (16)^2$
We can say 252 is (156 – 152) 4 less than $(16)^2$.
$\therefore$ If we add 4 to 252, it will be perfect square.
New number $= 252 + 4 = 256$

	16
1	256
+1	1
26	156
+6	156
32	0

$\therefore \sqrt{256} = 16$

(iv)

	42
4	1825
+4	16
82	225
+2	162
84	63

	43
4	1825
+4	16
83	225
+3	249

Here, $(42)^2 < 1825 > (43)^2$

We can say 1825 is (249 – 225) 24 less than $(43)^2$.

$\therefore$ If we add 24 to 1825, it will be perfect square.

New number = 1825 + 24 = 1849

	43
4	$\overline{18}\,\overline{49}$
+4	16
83	249
+3	249
86	0

$\therefore \sqrt{1849} = 43$

(v)

	80
8	$\overline{64}\,\overline{12}$
+8	64
160	120
0	0

	81
8	$\overline{64}\,\overline{12}$
+8	64
161	12
+1	161

Here, $(80)^2 < 6412 > (81)^2$

We can say 6412 is (161 – 12) 149 less than $(81)^2$.

$\therefore$ If we add 149 to 6412, it will be perfect square.

New number = 6412 + 149 = 656

	81
8	6561
+8	64
161	161
+1	161
162	0

∴ $\sqrt{6561} = 81$

6. Find the length of the side of a square whose area is 441 m2.

Solution:

Let the length of each side of the field = a Then, area of the field = 441 m2

⇒ a2 = 441 m2

⇒a = $\sqrt{441}$ m

	21
2	441
+ 2	4
41	41
+1	41
42	0

∴ The length of each side of the field = a m = 21 m.

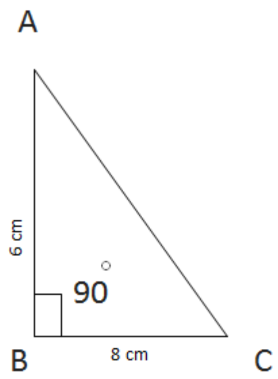
7. In a right triangle ABC, ∠B = 90°.

a. If AB = 6 cm, BC = 8 cm, find AC

b. If AC = 13 cm, BC = 5 cm, find AB

Solution:

a.



Given, AB = 6 cm, BC = 8 cm
Let AC be x cm.
∴ $AC^2 = AB^2 + BC^2$

$AC = \sqrt{AB^2 + BC^2}$

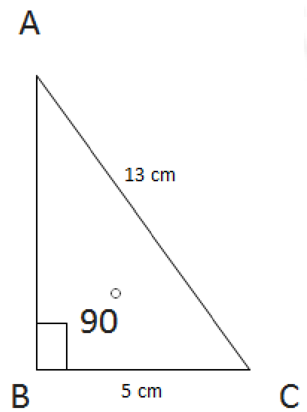
$= \sqrt{6^2 + 8^2}$

$= \sqrt{36 + 64}$

$= \sqrt{100} = 10$

Hence, AC = 10 cm.

b.



Given, AC = 13 cm, BC = 5 cm
Let AB be x cm.
∴ $AC^2 = AB^2 + BC^2$
⇒ $AC^2 - BC^2 = AB^2$

$AB = \sqrt{AC^2 - BC^2}$

$= \sqrt{13^2 - 5^2}$

$= \sqrt{169 - 25}$

$= \sqrt{144} = 12$

Hence, AB = 12 cm

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

Solution:

Let the number of rows and column be, x.

∴ Total number of row and column= x× x = x2 As per question, x2 = 1000

⇒ x = √1000

	31
3	$\overline{10}\,\overline{00}$
+3	9
61	100
+1	61

	32
3	$\overline{10}\,\overline{00}$
+3	9
62	100
+2	124

Here, $(31)^2 < 1000 > (32)^2$

We can say 1000 is (124 – 100) 24 less than $(32)^2$.

∴ 24 more plants are needed.

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.

Solution:

Let the number of rows and column be, x.

∴ Total number of row and column= $x \times x = x^2$ As per question, $x^2 = 500$

$x = \sqrt{500}$

	22
2	$\overline{5}\,\overline{00}$
+2	4
42	100
+2	84
44	16

Hence, 16 children would be left out in the arrangement