# Squares and Square Roots: Exercise 6.4

**Q.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** |

***Sol.*** (i) The square root of 2304 by using Division method:

| | 4 8 |
|---|---|
| 4 | $\overline{23}\ \overline{04}$ |
| +4 | - 16 |
| 88 | 704 |
| | - 704 |
| | 0 |

So, $\sqrt{2304} = 48$

(ii) The square root of 4489 by using Division method:

| | 6 7 |
|---|---|
| 6 | $\overline{44}\ \overline{89}$ |
| +6 | - 36 |
| 127 | 889 |
| | - 889 |
| | 0 |

So, $\sqrt{4489} = 67$

(iii) The square root of 3481 by using Division method:

| | 5 9 |
|---|---|
| 5 | $\overline{34}\ \overline{81}$ |
| +5 | - 25 |
| 109 | 981 |
| | - 981 |
| | 0 |

So, $\sqrt{3481} = 59$

(iv) The square root of 529 by using Division method:

| | 2 3 |
|---|---|
| 2 | $\overline{5}\ \overline{29}$ |
| +2 | - 4 |
| 43 | 129 |
| | - 129 |
| | 0 |

So, $\sqrt{529} = 23$

(v) The square root of 3249 by using Division method:

| | 5 7 |
|---|---|
| 5 | $\overline{32}\ \overline{49}$ |
| +5 | - 25 |
| 107 | 749 |
| | - 749 |
| | 0 |

So, $\sqrt{3249} = 57$

(vi) The square root of 1369 by using Division method:

| | 3 7 |
|---|---|
| 3 | $\overline{13}\ \overline{69}$ |
| +3 | - 9 |
| 67 | 469 |
| | - 469 |
| | 0 |

So, $\sqrt{1369} = 37$

(vii) The square root of 5776 by using Division method:

| | 7 6 |
|---|---|
| 7 | $\overline{57}\ \overline{76}$ |
| +7 | - 49 |
| 146 | 876 |
| | - 876 |
| | 0 |

So, $\sqrt{5776} = 76$

(viii) The square root of 7921 by using Division method:

| | 8 9 |
|---|---|
| 8 | $\overline{79}\ \overline{21}$ |
| +8 | - 64 |
| 169 | 1521 |
| | - 1521 |
| | 0 |

So, $\sqrt{7921} = 89$

(ix) The square root of 576 by using Division method:

| | 2 4 |
|---|---|
| 2 | $\overline{5}\ \overline{76}$ |
| +2 | - 4 |
| 44 | 176 |
| | - 176 |
| | 0 |

So, $\sqrt{576} = 24$

(x) The square root of 1024 by using Division method:

| | 3 2 |
|---|---|
| 3 | $\overline{10}\ \overline{24}$ |
| +3 | - 9 |
| 62 | 124 |
| | - 124 |
| | 0 |

So, $\sqrt{1024} = 32$

(xi) The square root of 3136 by using Division method:

| | 5 6 |
|---|---|
| 5 | $\overline{31}\ \overline{36}$ |
| +5 | - 25 |
| 106 | 636 |
| | - 636 |
| | 0 |

So, $\sqrt{3136} = 56$

(xii) The square root of 900 by using Division method:

| | 3 0 |
|---|---|
| 3 | $\overline{9}\ \overline{00}$ |
| | - 9 |
| 00 | 000 |
| | - 000 |
| | 0 |

So, $\sqrt{900} = 30$

**Q.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**

***Sol.*** (i) 64

Firstly place the bars from the end's digit by making pair,

64 = $\overline{64}$

Since, there is only one bar. So, the number of digits in the square root of 64 will be one.

(ii) 144
Firstly place the bars from the end's digit by making pair,
144 = $\overline{1}\ \overline{44}$
Since, there are two bars. So, the number of digits in the square root of 144 will be two.

(iii) 4489
Firstly place the bars from the end's digit by making pair,
4489 = $\overline{44}\ \overline{89}$
Since, there are two bars. So, the number of digits in the square root of 4489 will be two.

(iv) 27225
Firstly place the bars from the end's digit by making pair,
27225 = $\overline{2}\ \overline{72}\ \overline{25}$
Since, there are three bars. So, the number of digits in the square root of 27225 will be three.

(v) 390625
Firstly place the bars from the end's digit by making pair,
390625 = $\overline{39}\ \overline{06}\ \overline{25}$
Since, there are three bars. So, the number of digits in the square root of 390625 will be three.

**Q.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**
***Sol.*** (i) The square root of 2.56 by using Division method:

| | 1.6 |
|---|---|
| 1 | $\overline{2}.\ \overline{56}$ |
| +1 | - 1 |
| 26 | 126 |
| | - 126 |
| | 0 |

So, $\sqrt{1.26}$ = 1.6

(ii) The square root of 7.29 by using Division method:

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

So, $\sqrt{7.29}$ = 2.7
(iii) The square root of 51.84 by using Division method:

| | 7.2 |
|---|---|
| 7 | $\overline{51}.\overline{84}$ |
| +7 | - 49 |
| 142 | 284 |
| | - 284 |
| | 0 |

So, $\sqrt{51.84} = 7.2$

(iv) The square root of 42.25 by using Division method:

| | 6.5 |
|---|---|
| 6 | $\overline{42}.\overline{25}$ |
| +6 | - 36 |
| 125 | 625 |
| | - 625 |
| | 0 |

So, $\sqrt{42.25} = 6.5$

(v) The square root of 31.36 by using Division method:

| | 5.6 |
|---|---|
| 5 | $\overline{31}.\overline{36}$ |
| +5 | - 25 |
| 106 | 636 |
| | - 636 |
| | 0 |

So, $\sqrt{31.36} = 5.6$

**Q.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**
***Sol.*** (i) Firstly, we need to find the square root of 402 by using Division method.

| | 2 0 |
|---|---|
| 2 | $\overline{4}\,\overline{02}$ |
| +2 | - 2 |
| 40 | 002 |
| | - 000 |
| | 2 |

From above, we get the remainder 2. So, 2 should be subtracted from given number 402 so that it becomes a perfect square.

402 – 2 = 400

Thus, the square root of 400, $\sqrt{400}$ = 20.

(ii) Firstly, we need to find the square root of 1989 by using Division method.

| | 4 4 |
|---|---|
| 4 | $\overline{19}\ \overline{89}$ |
| +4 | - 16 |
| 84 | 389 |
| | - 336 |
| | 53 |

From above, we get remainder 53. So, 53 should be subtracted from the given number 1989 so that it becomes a perfect square.

1989 – 53 = 1936

Thus, the square root of 1936, $\sqrt{1936}$ = 44

(iii) Firstly, we need to find the square root of 3250 by using Division method.

| | 5 7 |
|---|---|
| 5 | $\overline{32}\ \overline{50}$ |
| +5 | - 25 |
| 107 | 750 |
| | - 749 |
| | 1 |

From above, we get remainder 1. So, 1 should be subtracted from the given number 3250 so that it becomes a perfect square.

3250 – 1 = 3249

Thus, the square root of 3249, $\sqrt{3249}$ = 57

(iv) Firstly, we need to find the square root of 825 by using Division method.

| | 2 8 |
|---|---|
| 2 | $\overline{8}\ \overline{25}$ |
| +2 | - 4 |
| 48 | 425 |
| | - 384 |
| | 41 |

From above, we get remainder 41. So, 41 should be subtracted from the given number 825 so that it becomes a perfect square.

825 – 41 = 784

Thus, the square root of 784, $\sqrt{784}$ = 28

(v) Firstly, we need to find the square root of 4000 by using Division method.

| | 6 3 |
|---|---|
| 6 | $\overline{40}\ \overline{00}$ |
| +6 | - 36 |
| 123 | 400 |
| | - 369 |
| | 31 |

From above, we get remainder 31. So, 31 should be subtracted from 3969 so that it becomes a perfect square.

4000 – 31 = 3969

Thus, the square root of 3969, $\sqrt{3969}$ = 63

**Q. 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**

***Sol.*** (i) Firstly, we need to find the square root of 525 by using Division method.

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

From above, we get remainder 41. It means that $22^2 < 525$. So, next number is 23 whose square is 529.
So, number to be added = 529 – 525 = 4
Thus, 4 should be added to 525 so that it becomes a perfect square.

525 + 4 = 529

Thus, the square root of 529, $\sqrt{529}$ = 23

(ii) Firstly, we need to find the square root of 1750 by using Division method.

| | 4 1 |
|---|---|
| 4 | $\overline{17}\ \overline{50}$ |
| +4 | - 16 |
| 81 | 150 |
| | - 81 |
| | 69 |

From above, we get remainder 69. It means that $41^2 < 1750$. So, next number is 42 whose square is 1764.
So, number to be added = 1764 – 1750 = 14
Thus, 14 should be added to 1750 so that it becomes a perfect square.

1750 + 14 = 1764

Thus, the square root of 1764, $\sqrt{1764}$ = 42

(iii) Firstly, we need to find the square root of 252 by using Division method.

| | 1 5 |
|---|---|
| 1 | $\overline{2}\ \overline{52}$ |
| +1 | - 1 |
| 25 | 152 |
| | - 125 |
| | 27 |

From above, we get remainder 27. It means that $15^2 < 252$. So, next number is 16 whose square is 256.
So, number to be added = 256 – 252 = 4
Thus, 4 should be added to 252 so that it becomes a perfect square.
252 + 4 = 256
Thus, the square root of 256, $\sqrt{256}$ = 16

(iv) Firstly, we need to find the square root of 1825 by using Division method.

| | 4 2 |
|---|---|
| 4 | $\overline{18}\ \overline{25}$ |
| +4 | - 16 |
| 82 | 225 |
| | - 164 |
| | 61 |

From above, we get remainder 61. It means that $42^2 < 1825$. So, next number is 43 whose square is 1849.
So, number to be added = 1849 – 1825 = 24
Thus, 24 should be added to 1825 so that it becomes a perfect square.
1825 + 24 = 1849
Thus, the square root of 1849, $\sqrt{1849}$ = 43

(v) Firstly, we need to find the square root of 6412 by using Division method.

| | 8 0 |
|---|---|
| 8 | $\overline{64}\ \overline{12}$ |
| +8 | - 64 |
| 160 | 012 |
| | - 000 |
| | 12 |

From above, we get remainder 12. It means that $80^2 < 6412$. So, next number is 81 whose square is 6561.
So, number to be added = 6561 – 6412 = 149
Thus, 149 should be added to 6412 so that it becomes a perfect square.
6412 + 149 = 6561
Thus, the square root of 6561, $\sqrt{6561}$ = 81.

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

***Sol.*** Let $l$ be the length of a side of square.

Since, area of square = (side)² = $(l)^2$.

So, $l^2 = 441$

$l = \sqrt{441}$

$3|441$

$3|147$

$7|49$

$7|7$

$|1$

$l = \sqrt{3x3x7x7} = 3 \times 7$

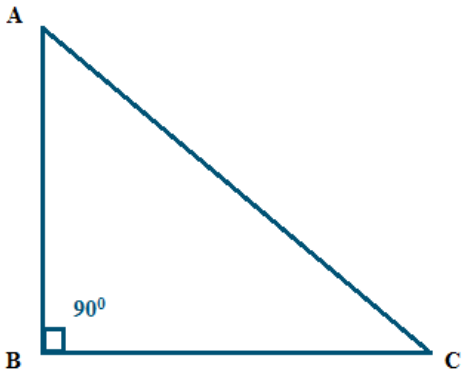
$l = 21$ m

Thus, the length of side of a square = 21 m

**Q.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**

***Sol.*** **Given:** In a right triangle ABC,




(a) AB = 6 cm, BC = 8 cm

By using Pythagoras theorem,

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

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

$\Rightarrow AC^2 = 36^2 + 64^2$

$\Rightarrow AC^2 = 100$

$\Rightarrow AC = \sqrt{100} = \sqrt{10 \times 10}$

$\Rightarrow AC = 10$ cm

(b) AC = 13 cm, BC = 5 cm

By using Pythagoras theorem,

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

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

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

$\Rightarrow AB^2 = 169 - 25$

$\Rightarrow AB^2 = 144$

$\Rightarrow AB = \sqrt{144} = \sqrt{12 \times 12}$

$\Rightarrow AB = 12$ cm

**Q.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.**

***Sol.*** Given: Number of plants, a gardener has = 1000

Since, gardener wants to plant these trees in such a way that the number of rows and the number of columns remain same.

So, firstly we need to find the square root of 1000.

| | 3 1 |
|---|---|
| 3 | $\overline{10}\,\overline{00}$ |
| +3 | - 9 |
| 61 | 100 |
| | - 61 |
| | 39 |

From above, we get remainder 39. It means that $31^2 < 1000$. So, next number is 32 whose square is 1024.

So, number to be added = 1024 – 1000 = 24

Thus, 24 should be added to 1000 so that it becomes a perfect square.

1000 + 24 = 1024

Thus, the gardener requires number of more plants = 24

**Q.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?**

***Sol.*** Given: number of children in a school = 500

Since, For a P.T. drill they have to stand in such a manner that the number of rows is equal to number of columns.

So, firstly we need find the square root of 500.

| | 2 2 |
|---|---|
| 2 | $\overline{5}\,\overline{00}$ |
| +2 | - 4 |
| 42 | 100 |
| | - 64 |
| | 16 |

From above, we get remainder 16. It means that $22^2 < 500$ by number 16.

So, 16 should be subtracted from 500 so that it becomes a perfect square.

500 – 16 = 484

Thus, the number of children who will be left out = 16