CBSE Class –VIII Mathematics

NCERT Solutions

CHAPTER - 6

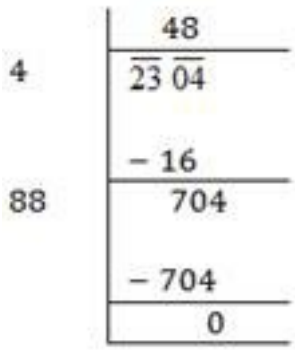
Squares and Square Roots (Ex. 6.4)

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

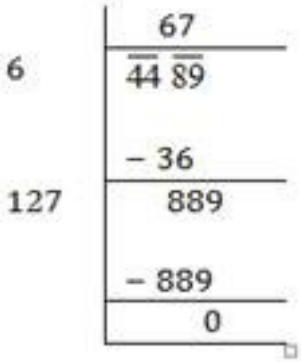
(vii) 5776 (viii) 7921 (ix) 576 (x) 1024 (xi) 3136 (xii) 900

Ans. (i) 2304



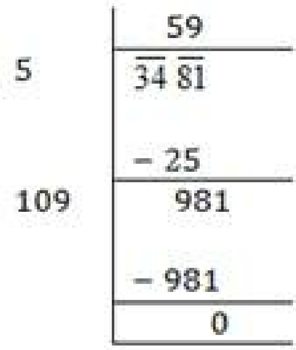
Hence, the square root of 2304 is 48.

(ii) 4489



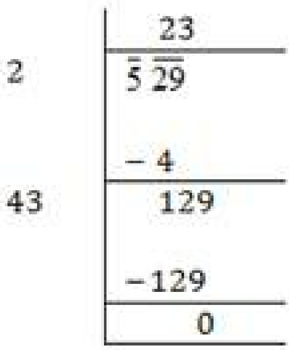
Hence, the square root of 4489 is 67.

(iii) 3481



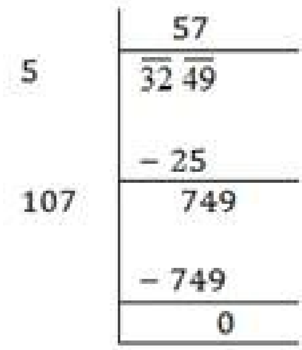
Hence, the square root of 3481 is 59.

(iv) 529



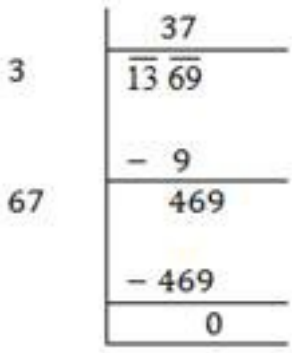
Hence, the square root of 529 is 23.

(v) 3249



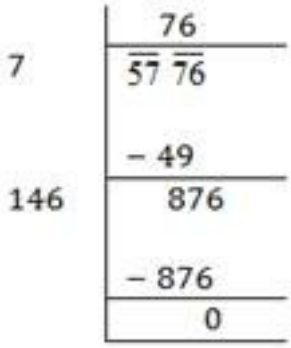
Hence, the square root of 3249 is 57.

(vi) 1369



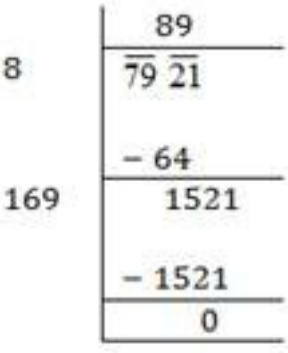
Hence, the square root of 1369 is 37.

(vii) 5776



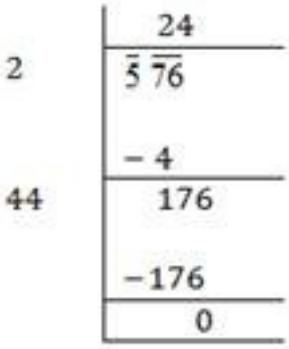
Hence, the square root of 5776 is 76.

(viii) 7921



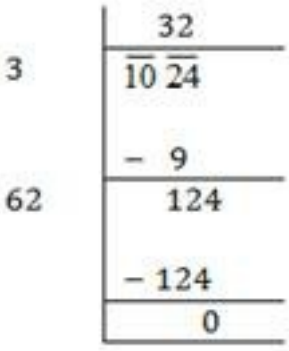
Hence, the square root of 7921 is 89.

(ix) 576



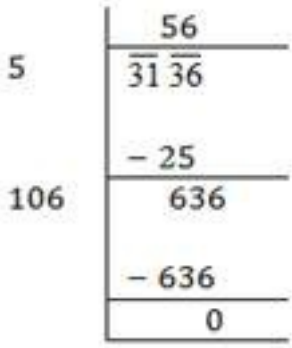
Hence, the square root of 576 is 24.

(x) 1024



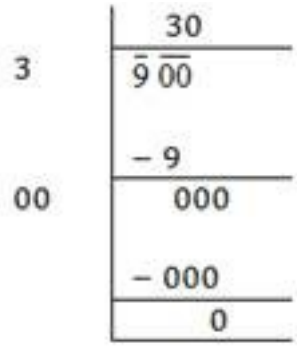
Hence, the square root of 1024 is 32.

(xi) 3136



Hence, the square root of 3136 is 56.

(xii) 900



Hence, the square root of 900 is 30.

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

Ans. (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 2-digit 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)

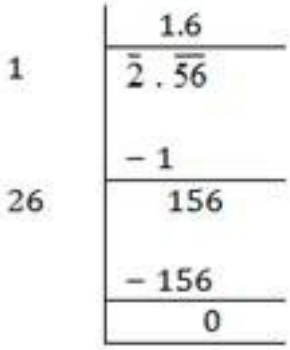
(v) Here, 390625 contains six digits which is even.

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

3. Find the square root of the following decimal numbers:

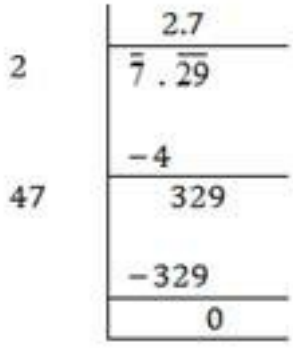
(i) 2.56 (ii) 7.29 (iii) 51.84 (iv) 42.25 (v) 31.36

Ans. (i) 2.56



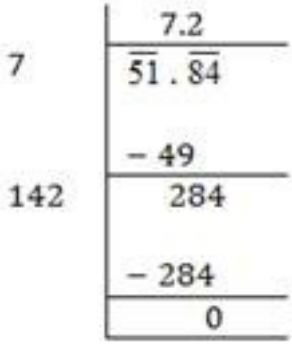
Hence, the square root of 2.56 is 1.6.

(ii) 7.29



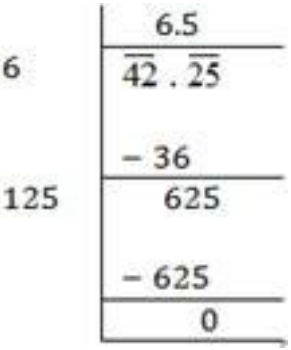
Hence, the square root of 7.29 is 2.7.

(iii) 51.84



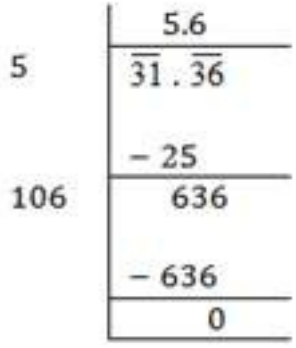
Hence, the square root of 51.84 is 7.2.

(iv) 42.25



Hence, the square root of 42.25 is 6.5.

(v) 31.36



Hence, the square root of 31.36 is 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

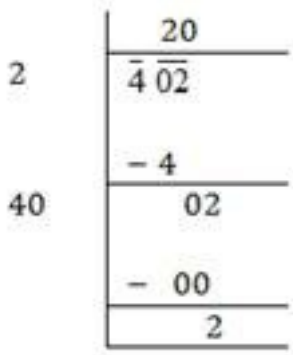
(iv) 825

(v) 4000

Ans. (i) 402

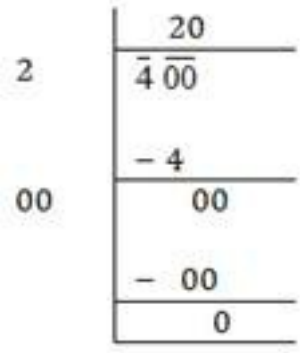
We know that, if we subtract the remainder from the number, we get a perfect square.

Here, we get remainder 2. Therefore 2 must be subtracted from 402 to get a perfect square.



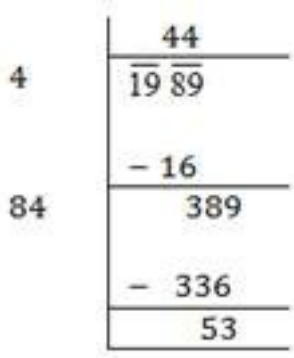
$\therefore$ 402 – 2 = 400

Hence, the square root of 400 is 20.



(ii) 1989

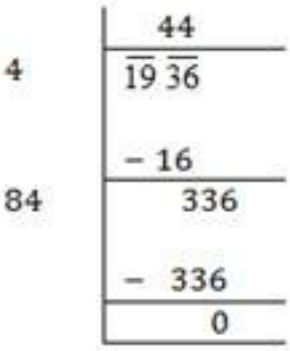
We know that, if we subtract the remainder from the number, we get a perfect square.



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

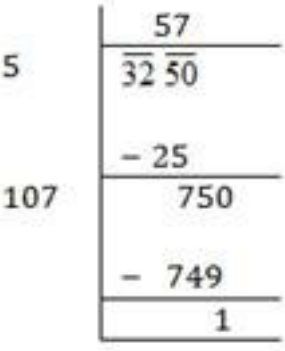
$\therefore$ 1989 – 53 = 1936

Hence, the square root of 1936 is 44.



(iii) 3250

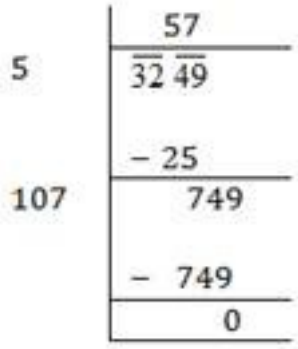
We know that, if we subtract the remainder from the number, we get a perfect square.



Here, we get remainder 1. Therefore 1 must be subtracted from 3250 to get a perfect square.

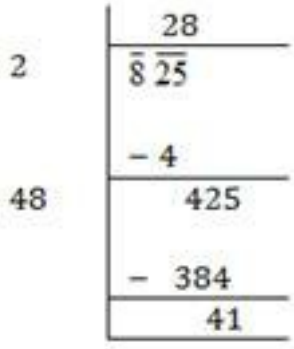
$\therefore$ 3250 – 1 = 3249

Hence, the square root of 3249 is 57.



(iv) 825

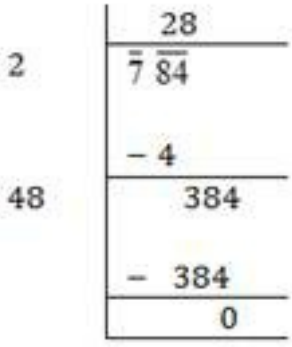
We know that, if we subtract the remainder from the number, we get a perfect square.



Here, we get remainder 41. Therefore 41 must be subtracted from 825 to get a perfect square.

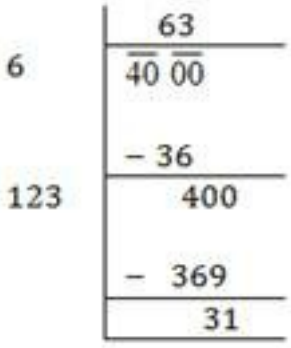
$\therefore$ 825 – 41 = 784

Hence, the square root of 784 is 28.



(v) 4000

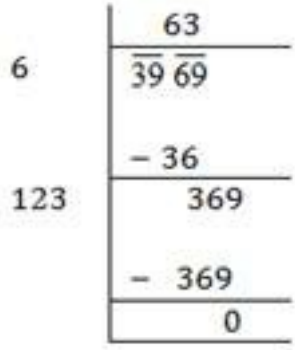
We know that, if we subtract the remainder from the number, we get a perfect square.



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

∴ 4000 – 31 = 3969

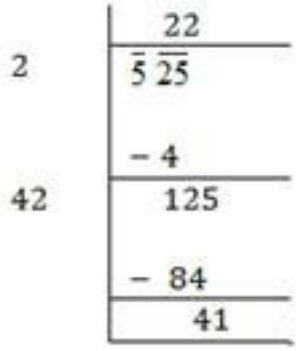
Hence, the square root of 3969 is 63.



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

Ans. (i) 525



Since the remainder is 41.

Therefore $22^2 < 525$

Next perfect square number 23^2 = 529

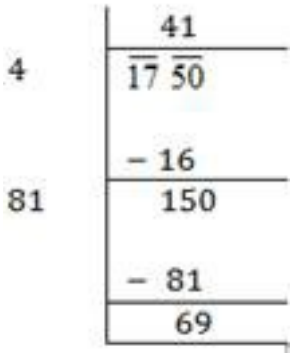
Hence, number to be added

= 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

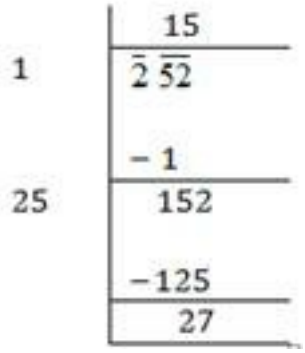
Hence, number to be added

= 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

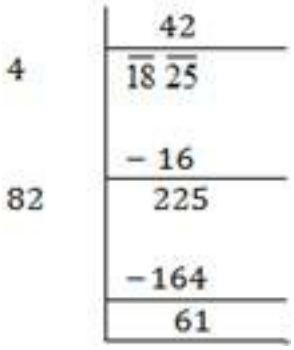
Hence, number to be added

= 256 – 252 = 4

∴ 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

∴ 1825 + 24 = 1849

Hence, the square root of 1849 is 43.

(v) 6412

	80
8	64 12
	− 64
160	0012
	− 0000
	12

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

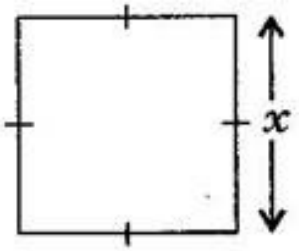
Hence, the square root of 6561 is 81.

6. Find the length of the side of a square whose area is $441\ m^2$?

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

Area of square $= (side)^2 = x^2$

According to question,



x^2 = 441

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

$= 3 \times 7$

$\Rightarrow x = 21$ m

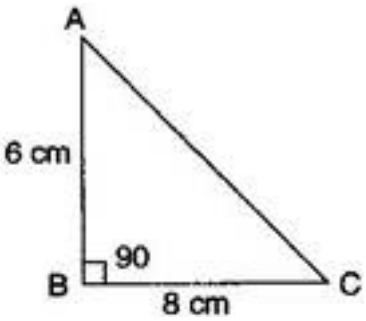
Hence, the length of the side of a square is 21 m.

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.

Ans. (i) Using Pythagoras theorem,



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

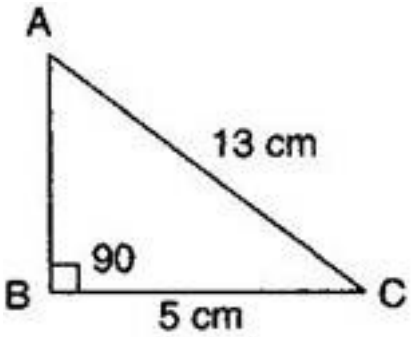
$\Rightarrow AC^2 = (6)^2 + (8)^2$

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

$\Rightarrow$ AC = $sqrt(100)$

$\Rightarrow$ 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

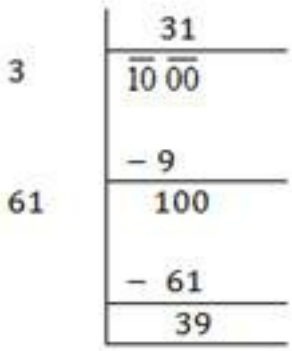
$\Rightarrow AB^2$ = 144

$\Rightarrow$ AB = $sqrt(144)$

$\Rightarrow$ AB= 12 cm

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.

Ans. Here, plants = 1000



Since remainder is 39.

Therefore $31^2 < 1000$

Next perfect square number 32^2 = 1024

Hence, number to be added

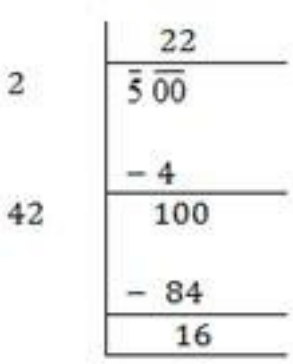
= 1024 – 1000 = 24

∴ 1000 + 24 = 1024

Hence, the gardener requires 24 more plants.

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?

Ans. 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.