RD Sharma Solutions Class 8 Maths Chapter 3 Ex 3.9

Using square root table, find the square roots of the following:

1.) 7

Answer:

From the table, we directly find that square root of 7 is 2.646.

2.) 15

Answer:

Using the table to find $\sqrt{3}$ and $\sqrt{5}$

$\sqrt{15} = \sqrt{3} \times \sqrt{5}$

$= 1.732 \times 2.236 = 3.873$

3.) 74

Answer:

Using the table to find $\sqrt{2}$ and $\sqrt{37}$

$\sqrt{74} = \sqrt{2} \times \sqrt{37}$

$= 1.414 \times 6.083 = 8.602$

4.) 82

Answer:

Using the table to find $\sqrt{2}$ and $\sqrt{41}$

$\sqrt{82} = \sqrt{2} \times \sqrt{41}$

$= 1.414 \times 6.403 = 9.055$

5.) 198

Answer:

Using the table to find $\sqrt{2}$ and $\sqrt{11}$

$\sqrt{198} = \sqrt{2} \times 9 \times \sqrt{41}$

$= 1.414 \times 3 \times 6.403 = 14.070$

6.) 540

Answer:

Using the table to find $\sqrt{3}$ and $\sqrt{5}$

$\sqrt{540} = \sqrt{54} \times \sqrt{10}$

$= 2 \times 3\sqrt{3} \times \sqrt{5} = 23.24$

7.) 8700

Answer:

Using the table to find $\sqrt{3}$ and $\sqrt{29}$

$\sqrt{8700} = \sqrt{3} \times \sqrt{29} \times \sqrt{100}$

= 1.414 x 6.403 x 10 = 93.27

8.) 3509

Answer:

Using the table to find $\sqrt{29}$

$\sqrt{3509} = \sqrt{121} \times \sqrt{29}$

= 11 x 5.3851 = 59.235

9.) 6929

Answer:

Using the table to find $\sqrt{41}$

$\sqrt{6929} = \sqrt{169} \times 9 \times \sqrt{41}$

= 13 x 6.403 = 83.239

10.) 25725

Answer:

Using the table to find $\sqrt{3}$ and $\sqrt{7}$

$\sqrt{25725} = \sqrt{3 \times 5 \times 5 \times 7 \times 7 \times 7}$

= 1.732 x 5 x 7 x 2.646 = 160.41

11.) 1312

Answer

Using the table to find $\sqrt{2}$ and $\sqrt{41}$

$\sqrt{1312} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 41}$

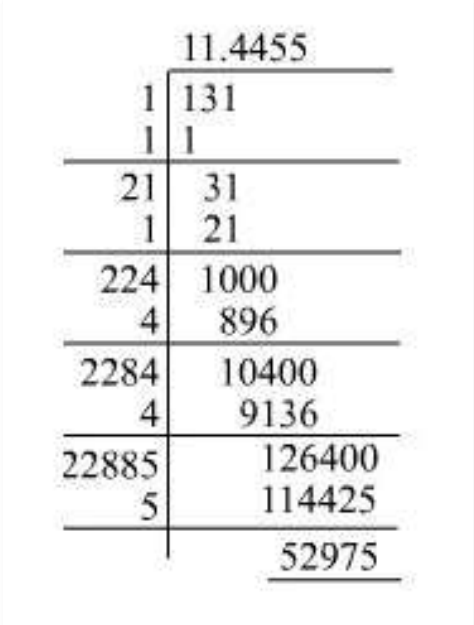
= 2 x 2 x 1.414 x 6.4031 = 36.222

12.) 4192

Answer:

$\sqrt{4192} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 131}$
$= 2 \times 2\sqrt{2} \times \sqrt{131}$

The square root of 131 is not listed in the table. Hence, we have to apply long division to find it.



Substituting the values:

= 2 x 2 x 11.4455 (using the table to find $\sqrt{2}$) = 64.75

13.) 4955

Answer:

On prime factorization:

4955 is equal to 5 x 991, which means that $\sqrt{4955} = \sqrt{5}$

The square root of 991 is not listed in the table; it lists the square roots of all the numbers below 100. Hence, we have to manipulate the number such that we get the square root of a number less than 100. This can be done in the following manner:

$\sqrt{4955} = \sqrt{49.55 \times 100} = \sqrt{49.55}$ x 10

Now, we have to find the square root of 49.55.

We have: $\sqrt{49} = 7$ and $\sqrt{50} = 7.071$.

Their difference is 0.071. Thus, for the difference of 1 (50 – 49), the difference in the values of the square roots is 0.071.

For the difference of 0.55, the difference in the values of the square roots is:

0.55 x 0.0701 = 0.03905

$\therefore \sqrt{49.55} = 7 + 0.03905 = 7.03905$

Finally, we have:

$\sqrt{49.55} = \sqrt{49.55} \times 10 = 7.03905 \text{x} 10 = 70.3905$

14.) $\frac{99}{144}$

Answer:

$\sqrt{\frac{99}{144}} = \frac{\sqrt{3 \times 3 \times 11}}{\sqrt{144}}$

$= \frac{3\sqrt{11}}{12} = \frac{3 \times 3.3166}{12}$ (using the square root to find $\sqrt{11}$) = 0.829

15.) $\frac{57}{169}$

Answer:

$\sqrt{\frac{57}{169}} = \frac{\sqrt{3\times19}}{\sqrt{169}}$

$= \frac{1.732\times4.3589}{13}$ (using the square root to find $\sqrt{3}$ and $\sqrt{19}$) = 0.581

16.) $\frac{101}{169}$

$\sqrt{\frac{101}{169}} = \frac{\sqrt{101}}{\sqrt{169}}$

The square of 101 is not listed in the table. This is because the table lists the square roots of all the numbers below 100.

Hence, we have to manipulate the number such that we get the square root of a number less than 100.

This can be done in the following manner:

$\sqrt{101} = \sqrt{1.01 \times 100} = \sqrt{1.01} \times 10$

Now, we have to find the square root of 1.01.

We have:

$\sqrt{1} = 1 \text{and} \sqrt{2} = 1.414$

Their difference is .414.

Thus, for the difference of 1(2 -1), the difference in the values of the square roots is .414.

For the difference of .01, the difference in the values of the square roots is:

0.1 x 0.414 = 0.00414

$\therefore \sqrt{1.01} = 1 + .00414 = 1.00414$ $\sqrt{101} = \sqrt{1.01} \times 10 = 1.00414 \times 10 = 10.0414$

Finally,

$\sqrt{\frac{101}{169}} = 0.772$

This value is really close to the one from the key answer.

17.) 13.21

Answer:

From the square root table, we have:

$\sqrt{13} = 3.606$ and $\sqrt{14} = \sqrt{2} \times \sqrt{7} = 3.742$

Their difference is 0.136.

Thus, for the difference of 1 (14 – 13), the difference in the values of the square roots is 0.136.

For the difference of 0.21, the difference in the values of their square roots is:

0.136 x 0.21 = 0.2856

$\therefore \sqrt{13.21} = 3.606 + 0.02856 \approx 3.635$

18.) 21.97

Answer:

We have to find $\sqrt{21.97}$

From the square root table, we have:

$\sqrt{21} = \sqrt{3} \times \sqrt{7} = 4.583 \text{and} \sqrt{22} = \sqrt{2} \times \sqrt{11} = 4.690$

Their difference is 0.107.

Thus, for the difference of 1 (22 – 21), the difference in the values of the square roosts is 0.107.

For the difference of 0.97, the difference in the values of their square roots is:

0.107 x 0.97 = 0.104

$\therefore \sqrt{21.97} = 4.583 + 0104 \approx 4.687$

19.) 110

Answer:

$\sqrt{110} = \sqrt{2} \times \sqrt{5} \times \sqrt{11}$
= 1.414 x 2.236 x 3.317 (Using the square root table to find all the square roots) = 10.488

20.) 1110

Answer:

$\sqrt{1110} = \sqrt{2} \times \sqrt{3} \times \sqrt{5} \times \sqrt{37}$
= 1.414 x 1.732 x 2.236 x 6.083 (using the table to find all the square roots) = 33.312

21.) 11.11

Answer:

We have:

$\sqrt{11} = 3.317 \text{and} \sqrt{12} = 3.464$
Their difference is 0.1474.

Thus, for the difference of 1 (12 – 11), the difference in the values of the square roots is 0.1474.

For the difference of 0.11, the difference in the values of the square roots is:

0.11 x 0.1474 = 0.0162

$\therefore \sqrt{11.11} = 3.3166 + 0.0162 = 3.328 \approx 3.333$

22.) The area of a square field is 325 m^2. Find the appropriate length of one side of the field.

Answer:

The length of one side of the square field will be the square root of 325.

$\therefore \sqrt{325} = \sqrt{5 \times 5 \times 13}$
= 5 x $\sqrt{13}$

= 5 x 3.605 = 18.030

Hence, the length of one side of the field is 18.030 m.

23.) Find the length of a side of a square, whose area is equal to the area of a rectangle with sides 240m and 70 m.

Answer:

The area of the rectangle = 240 m x 70 m =16800m^2

Given that the length of the square is equal to the area of the rectangle.

Hence, the area of the square will also be 16800 m^2.

The length of one side of a square is the square root of its area.

$\therefore \sqrt{16800} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7}$
= 2 x2 x 5 $\sqrt{2 \times 3 \times 7}$

= 20 $\sqrt{42}$ = 129.60 m

Hence, the length of one side of the square is 129.60 m.