

EXERCISE 3.7

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Find the square root of the following numbers in decimal form:

1. 84.8241

Solution:

By using long division method

$$\begin{array}{r} 9.21 \\ 9 \overline{) 84.8241} \\ \underline{81} \\ 182 \\ \underline{182} \\ 1841 \\ \underline{1841} \\ 0 \end{array}$$

\therefore the square root of 84.8241

$$\sqrt{84.8241} = 9.21$$

2. 0.7225

Solution:

By using long division method

$$\begin{array}{r} 0.85 \\ 0 \overline{) 0.7225} \\ \underline{0} \\ 8 \\ \underline{72} \\ 165 \\ \underline{165} \\ 0 \end{array}$$

\therefore the square root of 0.7225

$$\sqrt{0.7225} = 0.85$$

3. 0.813604

Solution:

By using long division method

$$\begin{array}{r}
 0.902 \\
 0 \overline{) 0.813604} \\
 \underline{0} \\
 9 \quad 81 \\
 \underline{81} \\
 180 \quad 36 \\
 \underline{0} \\
 1802 \quad 3604 \\
 \underline{3604} \\
 0
 \end{array}$$

∴ the square root of 0.813604
 $\sqrt{0.813604} = 0.902$

4. 0.00002025

Solution:

By using long division method

$$\begin{array}{r}
 0.0045 \\
 0 \overline{) 0.00002025} \\
 \underline{0 \quad 0 \quad 0} \\
 4 \quad 20 \\
 \underline{16} \\
 85 \quad 425 \\
 \underline{425} \\
 0
 \end{array}$$

∴ the square root of 0.00002025
 $\sqrt{0.00002025} = 0.0045$

5. 150.0625

Solution:

By using long division method

$$\begin{array}{r}
 12.25 \\
 1 \overline{) 150.0625} \\
 \underline{1} \\
 22 \quad 050 \\
 \underline{44} \\
 242 \quad 606 \\
 \underline{484} \\
 2445 \quad 12225 \\
 \underline{12225} \\
 0
 \end{array}$$

∴ the square root of 150.0625
 $\sqrt{150.0625} = 12.25$

6. 225.6004
Solution:

By using long division method

$$\begin{array}{r}
 15.02 \\
 1 \overline{) 225.6004} \\
 \underline{1} \\
 125 \\
 \underline{125} \\
 060 \\
 \underline{0} \\
 6004 \\
 \underline{6004} \\
 0
 \end{array}$$

∴ the square root of 225.6004
 $\sqrt{225.6004} = 15.02$

7. 3600.720036
Solution:

By using long division method

$$\begin{array}{r}
 60.006 \\
 6 \overline{) 3600.720036} \\
 \underline{36} \\
 000 \\
 \underline{0} \\
 7200 \\
 \underline{0000} \\
 720036 \\
 \underline{720036} \\
 0
 \end{array}$$

∴ the square root of 3600.720036
 $\sqrt{3600.720036} = 60.006$

8. 236.144689
Solution:

By using long division method

$$\begin{array}{r}
 15.367 \\
 1 \overline{) 236.144689} \\
 \underline{1} \\
 25 \\
 \underline{136} \\
 125 \\
 \underline{1114} \\
 909 \\
 \underline{3066} \\
 20546 \\
 \underline{18396} \\
 30727 \\
 \underline{215089} \\
 215089 \\
 \underline{} \\
 0
 \end{array}$$

∴ the square root of 236.144689
 $\sqrt{236.144689} = 15.367$

9. 0.00059049

Solution:

By using long division method

$$\begin{array}{r}
 0.0243 \\
 0 \overline{) 0.00059049} \\
 \underline{0} \\
 0 \\
 \underline{0} \\
 2 \\
 \underline{05} \\
 4 \\
 \underline{44} \\
 190 \\
 \underline{176} \\
 483 \\
 \underline{1449} \\
 1449 \\
 \underline{} \\
 0
 \end{array}$$

∴ the square root of 0.00059049
 $\sqrt{0.00059049} = 0.0243$

10. 176.252176

Solution:

By using long division method

$$\begin{array}{r}
 13.276 \\
 1 \overline{) 176.252176} \\
 \underline{1} \\
 13 \\
 \underline{076} \\
 69 \\
 \underline{262} \\
 725 \\
 \underline{524} \\
 2647 \\
 \underline{20121} \\
 18529 \\
 \underline{26546} \\
 159276 \\
 \underline{159276} \\
 0
 \end{array}$$

∴ the square root of 176.252176
 $\sqrt{176.252176} = 13.276$

11. 9998.0001

Solution:

By using long division method

$$\begin{array}{r}
 99.99 \\
 9 \overline{) 9998.0001} \\
 \underline{81} \\
 189 \\
 \underline{1898} \\
 1701 \\
 \underline{1989} \\
 17901 \\
 \underline{19989} \\
 179901 \\
 \underline{179901} \\
 0
 \end{array}$$

∴ the square root of 9998.0001
 $\sqrt{9998.0001} = 99.99$

12. 0.00038809

Solution:

By using long division method

$$\begin{array}{r}
 0.0197 \\
 \hline
 0 \quad 0.00038809 \\
 \quad 0 \\
 \hline
 0 \quad 000 \\
 \quad 0 \\
 \hline
 1 \quad 03 \\
 \quad 1 \\
 \hline
 29 \quad 288 \\
 \quad 261 \\
 \hline
 387 \quad 2709 \\
 \quad 2709 \\
 \hline
 \quad 0
 \end{array}$$

∴ the square root of 0.00038809
 $\sqrt{0.00038809} = 0.0197$

13. What is that fraction which when multiplied by itself gives 227.798649?

Solution:

Let us consider a number a

$$\begin{aligned}
 \text{Where, } a &= \sqrt{227.798649} \\
 &= 15.093
 \end{aligned}$$

By using long division method let us verify

$$\begin{array}{r}
 15.093 \\
 \hline
 1 \quad 227.798649 \\
 \quad 1 \\
 \hline
 25 \quad 127 \\
 \quad 125 \\
 \hline
 300 \quad 279 \\
 \quad 0 \\
 \hline
 3009 \quad 27986 \\
 \quad 27081 \\
 \hline
 30183 \quad 90549 \\
 \quad 90549 \\
 \hline
 \quad 0
 \end{array}$$

∴ 15.093 is the fraction which when multiplied by itself gives 227.798649.

14. The area of a square playground is 256.6404 square meter. Find the length of one side of the playground.

Solution:

We know that the given area of a square playground = 256.6404

$$\text{i.e., } L^2 = 256.6404 \text{ m}^2$$

$$L = \sqrt{256.6404}$$

$$= 16.02\text{m}$$

By using long division method let us verify

$$\begin{array}{r}
 16.02 \\
 1 \overline{) 256.6404} \\
 \underline{1} \\
 156 \\
 \underline{156} \\
 064 \\
 \underline{0} \\
 6404 \\
 \underline{6404} \\
 0
 \end{array}$$

\therefore length of one side of the playground is 16.02m.

15. What is the fraction which when multiplied by itself gives 0.00053361?

Solution:

Let us consider a number a

$$\text{Where, } a = \sqrt{0.00053361}$$

$$= 0.0231$$

By using long division method let us verify

$$\begin{array}{r}
 0.0231 \\
 0 \overline{) 0.00053361} \\
 \underline{0} \\
 000 \\
 \underline{0} \\
 005 \\
 \underline{4} \\
 133 \\
 \underline{129} \\
 461 \\
 \underline{461} \\
 0
 \end{array}$$

\therefore 0.0231 is the fraction which when multiplied by itself gives 0.00053361.

16. Simplify:

(i) $(\sqrt{59.29} - \sqrt{5.29}) / (\sqrt{59.29} + \sqrt{5.29})$

(ii) $(\sqrt{0.2304} + \sqrt{0.1764}) / (\sqrt{0.2304} - \sqrt{0.1764})$

Solution:

(i) $(\sqrt{59.29} - \sqrt{5.29}) / (\sqrt{59.29} + \sqrt{5.29})$

Firstly let us find the square root $\sqrt{59.29}$ and $\sqrt{5.29}$

$$\begin{aligned}\sqrt{59.29} &= \sqrt{5929} / \sqrt{100} \\ &= 77/10 \\ &= 7.7\end{aligned}$$

$$\begin{aligned}\sqrt{5.29} &= \sqrt{529} / \sqrt{100} \\ &= 23/10 \\ &= 2.3\end{aligned}$$

$$\begin{aligned}\text{So, } (7.7 - 2.3) / (7.7 + 2.3) & \\ &= 54/10 \\ &= 0.54\end{aligned}$$

(ii) $(\sqrt{0.2304} + \sqrt{0.1764}) / (\sqrt{0.2304} - \sqrt{0.1764})$

Firstly let us find the square root $\sqrt{0.2304}$ and $\sqrt{0.1764}$

$$\begin{aligned}\sqrt{0.2304} &= \sqrt{2304} / \sqrt{10000} \\ &= 48/100 \\ &= 0.48\end{aligned}$$

$$\begin{aligned}\sqrt{0.1764} &= \sqrt{1764} / \sqrt{10000} \\ &= 42/100 \\ &= 0.42\end{aligned}$$

$$\begin{aligned}\text{So, } (0.48 + 0.42) / (0.48 - 0.42) & \\ &= 0.9/0.06 \\ &= 15\end{aligned}$$

17. Evaluate $\sqrt{50625}$ and hence find the value of $\sqrt{506.25} + \sqrt{5.0625}$

Solution:

By using long division method let us find the $\sqrt{50625}$

	225
2	50625
42	4
445	106
	84
	2225
	2225
	0

$$\begin{aligned}\text{So now, } \sqrt{506.25} &= \sqrt{50625} / \sqrt{100} \\ &= 225/10 \\ &= 22.5\end{aligned}$$

$$\begin{aligned}\sqrt{5.0625} &= \sqrt{50625} / \sqrt{10000} \\ &= 225/100 \\ &= 2.25\end{aligned}$$

So equating in the above equation we get,

$$\begin{aligned}\sqrt{506.25} + \sqrt{5.0625} &= 22.5 + 2.25 \\ &= 24.75\end{aligned}$$

18. Find the value of $\sqrt{103.0225}$ and hence find the value of

(i) $\sqrt{10302.25}$

(ii) $\sqrt{1.030225}$

Solution:

By using long division method let us find the

$$\sqrt{103.0225} = \sqrt{(1030225/10000)} = \sqrt{1030225}/\sqrt{10000}$$

	1015	
1	1	1 03 02 25
	1	
201	0302	
	201	
2025	10125	
	10125	
	0	

So now, (i) $\sqrt{10302.25} = \sqrt{(1030225/ 100)}$
 $= 1015/ 10$
 $= 101.5$

(ii) $\sqrt{1.030225} = \sqrt{1030225/ \sqrt{1000000}}$
 $= 1015/1000$
 $= 1.015$