

## 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

$$\begin{array}{r}
 9.21 \\
 9 \overline{) 84.8241} \\
 \underline{81} \phantom{00} \\
 182 \phantom{00} \\
 \underline{182} \phantom{00} \\
 0 \phantom{00} \\
 1841 \phantom{00} \\
 \underline{1841} \phantom{00} \\
 0
 \end{array}$$

$\therefore$  the square root of 84.8241

$$\sqrt{84.8241} = 9.21$$

2. 0.7225

**Solution:**

By using long division method

$$\begin{array}{r}
 0.85 \\
 0 \overline{) 0.7225} \\
 \underline{0} \phantom{00} \\
 8 \phantom{00} \\
 \underline{72} \phantom{00} \\
 165 \phantom{00} \\
 \underline{165} \phantom{00} \\
 0
 \end{array}$$

$\therefore$  the square root of 0.7225

$$\sqrt{0.7225} = 0.85$$

3. 0.813604

**Solution:**

By using long division method

	0.902
0	0.813604
	0
9	81
	81
180	36
	0
1802	3604
	3604
	0

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

#### 4. 0.00002025

**Solution:**

By using long division method

	0.0045
0	0.00002025
	0 0 0
4	20
	16
85	425
	425
	0

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

#### 5. 150.0625

**Solution:**

By using long division method

	12.25
1	150.0625
	1
22	050
	44
242	606
	484
2445	12225
	12225
	0

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

### 6. 225.6004

**Solution:**

By using long division method

$$\begin{array}{r}
 15.02 \\
 1 \overline{) 225.6004} \\
 \underline{1} \phantom{00} \\
 25 \phantom{00} \\
 \underline{25} \phantom{00} \\
 300 \phantom{00} \\
 \underline{300} \phantom{00} \\
 3002 \phantom{00} \\
 \underline{3002} \phantom{00} \\
 0
 \end{array}$$

$\therefore$  the square root of 225.6004

$$\sqrt{225.6004} = 15.02$$

### 7. 3600.720036

**Solution:**

By using long division method

$$\begin{array}{r}
 60.006 \\
 6 \overline{) 3600.720036} \\
 \underline{36} \phantom{00} \\
 120 \phantom{00} \\
 \underline{120} \phantom{00} \\
 1200 \phantom{00} \\
 \underline{1200} \phantom{00} \\
 12006 \phantom{00} \\
 \underline{12006} \phantom{00} \\
 0
 \end{array}$$

$\therefore$  the square root of 3600.720036

$$\sqrt{3600.720036} = 60.006$$

### 8. 236.144689

**Solution:**

By using long division method

$$\begin{array}{r}
 15.367 \\
 1 \overline{) 236.144689} \\
 \underline{1} \phantom{00} \\
 25 \phantom{00} \overline{) 136} \\
 \underline{125} \phantom{00} \\
 303 \phantom{00} \overline{) 1114} \\
 \underline{909} \phantom{00} \\
 3066 \phantom{00} \overline{) 20546} \\
 \underline{18396} \phantom{00} \\
 30727 \phantom{00} \overline{) 215089} \\
 \underline{215089} \\
 0
 \end{array}$$

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

### 9. 0.00059049

**Solution:**

By using long division method

$$\begin{array}{r}
 0.0243 \\
 0 \overline{) 0.00059049} \\
 \underline{0} \phantom{0000} \\
 0 \phantom{0000} \overline{) 0} \\
 \underline{0} \phantom{0000} \\
 2 \phantom{0000} \overline{) 05} \\
 \underline{4} \phantom{0000} \\
 44 \phantom{0000} \overline{) 190} \\
 \underline{176} \phantom{0000} \\
 483 \phantom{0000} \overline{) 1449} \\
 \underline{1449} \\
 0
 \end{array}$$

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

### 10. 176.252176

**Solution:**

By using long division method

	13.276
1	<u>176.252176</u>
	1
13	<u>076</u>
	69
262	<u>725</u>
	524
2647	<u>20121</u>
	18529
26546	<u>159276</u>
	159276
	0

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

### 11. 9998.0001

**Solution:**

By using long division method

	99.99
9	<u>9998.0001</u>
	81
189	<u>1898</u>
	1701
1989	<u>19700</u>
	17901
19989	<u>179901</u>
	179901
	0

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

### 12. 0.00038809

**Solution:**

By using long division method

	0.0197
0	0.00038809
	0
0	000
	0
1	03
	1
29	288
	261
387	2709
	2709
	0

∴ 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

Where,  $a = \sqrt{227.798649}$   
 $= 15.093$

By using long division method let us verify

	15.093
1	227.798649
	1
25	127
	125
300	279
	0
3009	27986
	27081
30183	90549
	90549
	0

∴ 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

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

$$\begin{array}{r} 16.02 \\ 1 \overline{) 256.6404} \\ \underline{1} \phantom{00} \\ 26 \phantom{00} \\ \underline{26} \phantom{00} \\ 320 \phantom{00} \\ \underline{320} \phantom{00} \\ 3202 \phantom{00} \\ \underline{3202} \phantom{00} \\ 0 \end{array}$$

$\therefore$  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

$$\begin{array}{r} 0.0231 \\ 0 \overline{) 0.00053361} \\ \underline{0} \phantom{0000} \\ 0 \phantom{0000} \\ \underline{0} \phantom{0000} \\ 2 \phantom{0000} \\ \underline{2} \phantom{0000} \\ 43 \phantom{0000} \\ \underline{43} \phantom{0000} \\ 461 \phantom{0000} \\ \underline{461} \phantom{0000} \\ 0 \end{array}$$

$\therefore$  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  $\sqrt{5.29}$

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

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

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

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

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  $\sqrt{50625}$

$$\begin{array}{r} 225 \\ 2 \overline{) 50625} \\ \underline{4} \phantom{00} \\ 42 \phantom{00} \overline{) 106} \\ \underline{84} \phantom{00} \\ 445 \phantom{00} \overline{) 2225} \\ \underline{2225} \phantom{00} \\ 0 \end{array}$$

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

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



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  $\sqrt{103.0225}$

	10.15
1	$\overline{103.0225}$
	1
20	$\overline{003}$
	0
201	$\overline{302}$
	201
2025	$\overline{10125}$
	10125
	0

$$\begin{aligned}\text{So now, (i) } \sqrt{10302.25} &= \sqrt{(10302.25 \times 100)} \\ &= 10 \times 10.15 \\ &= 101.5\end{aligned}$$

$$\begin{aligned}\text{(ii) } \sqrt{1.030225} &= \sqrt{1.030225} / \sqrt{1000} \\ &= 10.15/10 \\ &= 1.015\end{aligned}$$