

Exercise 37

~~Q1~~ Find the square root of the following numbers in decimal form:

Q

1 84.8241

Solution: By long division method.

$$\begin{array}{r}
 9.21 \\
 9 \overline{) 84.8241} \\
 \underline{+9} \quad \underline{+81} \\
 182 \quad 382 \\
 \underline{+2} \quad \underline{364} \\
 1841 \quad 1841 \\
 \underline{} \quad \underline{1841} \\
 0
 \end{array}$$

2. $\sqrt{0.7225} = 0.85$

$$\begin{array}{r}
 0.85 \\
 8 \overline{) 0.7225} \\
 \underline{+8} \quad \underline{64} \\
 165 \quad 825 \\
 \underline{} \quad \underline{825} \\
 0
 \end{array}$$

3. 0.813604

$\therefore \sqrt{0.813604} = 0.902$

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

4. 0.00002025

	0.0045
0	$0.\overline{00002025}$
	0
4	20
+4	16
85	425
	425
	0

$$\therefore \sqrt{0.00002025} = 0.0045$$

5. 150.0625

	12.25
1	$1\overline{50.0625}$
+1	1
22	50
+2	44
242	606
+2	484
244	12225
	-12225
	0

$$\therefore \sqrt{150.0625} = 12.25$$

⑥ 225.6004

$\therefore \sqrt{225.6004} = 15.02$

	15.02
1	$\overline{225.6004}$
+1	1
25	125
+5	125
3002	6004
	6004
	0

⑦ 3600.720036

	60.006
6	$\overline{3600.720036}$
+6	36
120	00
	0
1200	7200
	0000
12006	720036
	720036

$\therefore \sqrt{3600.720036} = 60.006$

8 236.144689

$\therefore \sqrt{236.144689} = 15.367$

	15.367
1	$\overline{236.144689}$
+1	1
25	136
+1	125
303	1414
+3	909
3066	20546
	18396
30727	215089
	215089

⑨ 0.00059049

$$= \sqrt{0.00059049} = 0.0243$$

	<u>0.0243</u>
0	0.00059049
0	0
0	0
2	05
	<u>4</u>
44	190
+4	176
483	1449
	1449
	<u>0</u>

⑩ 176.252176

$$= \sqrt{176.252176} = 13.276$$

	<u>13.276</u>
1	176.252176
+1	1
23	76
+3	69
262	725
+2	524
2647	20121
+7	18529
26546	159276
	159276
	<u>0</u>

⑪ 9998.0001

$$\therefore \sqrt{9998.0001} = 99.99$$

	99.99
9	$\overline{9998.0001}$
+9	81
189	1898
+9	1701
1989	19700
+9	17901
19989	179901
	179901
	0

12 0.00038809

$$\sqrt{0.00038809} = 0.0197$$

	0.0197
0	$\overline{0.00038809}$
	00
1	3
+1	1
29	288
+9	261
387	2709
	2709
	0

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

Solution: Let required fraction be x

$$x^2 = 227.798649$$

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

Solution: Let required fraction be x

$$x^2 = 0.00053361$$

$$x = \sqrt{0.00053361}$$

$$\Rightarrow x = 0.0231$$

	. 0231
0	0.00053361
	0
2	5
+2	4
43	133
+3	129
461	461
	461

Q.16 Simplify (i) $\frac{\sqrt{59.29} - \sqrt{5.29}}{\sqrt{59.29} + \sqrt{5.29}}$

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

Solution (i)

$$\sqrt{59.29} = 7.7, \quad \sqrt{5.29} = 2.3$$

$$\frac{7.7 - 2.3}{7.7 + 2.3} = \frac{5.4}{10} = 0.54$$

	7.7
7	59.29
+7	49
147	1029
	1029
	0

$$(ii) \sqrt{0.2304} = 0.48$$

$$\sqrt{0.1764} = 0.42$$

$$\begin{array}{r} 0.48 \\ 4 \overline{) 0.2304} \\ \underline{+4} 16 \\ 704 \\ \underline{704} \\ 0 \end{array}$$

$$\begin{array}{r} 0.42 \\ 4 \overline{) 0.1764} \\ \underline{+4} 16 \\ 164 \\ \underline{164} \\ 0 \end{array}$$

$$\therefore \frac{\sqrt{0.2304} + \sqrt{0.1764}}{\sqrt{0.2304} - \sqrt{0.1764}}$$

$$= \frac{0.48 + 0.42}{0.48 - 0.42} = \frac{0.90}{0.06} = \frac{90}{6} = 15$$

Q.17 Evaluate $\sqrt{50625}$ and hence find the value

of $\sqrt{506.25} + \sqrt{5.0625}$

Solution:

$$\begin{array}{r} 225 \\ 2 \overline{) 50625} \\ \underline{+2} 4 \\ 42 \\ \underline{+2} 84 \\ 2225 \\ \underline{2225} \\ 0 \end{array}$$

hence

$$\sqrt{50625} = 225$$

$$\therefore \sqrt{506.25} = 22.5, \quad \sqrt{5.0625} = 2.25$$

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

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

(i) $\sqrt{10302.25}$

(ii) $\sqrt{1.030225}$

Solution:

	10.15	103.0225
	1	1
+1	201	0302
	+1	201
2025	10125	10125
		10125
		0

$$\therefore \sqrt{103.0225} = 10.15$$

also (i) $\sqrt{10302.25} = 101.5$

(ii) $\sqrt{1.030225} = 1.015$