

Exercise # 2.1 (Solution)

1. Convert following Rational Number in to decimal Fraction and separate terminating and non-Terminating?

(i) $\frac{5}{7}$

Sol:
$$\begin{array}{r} 0.7142857 \\ 7 \overline{) 5.000000} \\ \underline{-49} \end{array}$$

$$\begin{array}{r} 10 \\ 7 \\ \hline 30 \\ 28 \end{array}$$

$$20$$

$$14$$

$$60$$

$$\frac{5}{7} = 0.7142857 \dots$$

(non-Terminating) 35

$$50$$

$$49$$

$$1$$

(ii) $\frac{3}{5}$

$$\begin{array}{r} 0.6 \\ 5 \overline{) 3.0} \\ \underline{30} \\ 0 \end{array}$$

$\frac{3}{5} = 0.6$ Terminating

(iii) $\frac{6}{7}$

$$\begin{array}{r} 0.8571428 \\ 7 \overline{) 6.000000} \\ \underline{-56} \end{array}$$

$$40$$

$$-35$$

$$50$$

$$-49$$

$$10$$

$$\frac{6}{7} = 0.8571428 \dots$$

(non-Terminating)

$$30$$

$$-28$$

$$20$$

$$-14$$

$$60$$

$$-56$$

$$4$$

(i) $\frac{3}{7} = 0.4285714$

Sol: $7 \overline{) 3.0000000}$

$$\begin{array}{r}
 -28 \\
 \hline
 20 \\
 -14 \\
 \hline
 60 \\
 -56 \\
 \hline
 40 \\
 -35 \\
 \hline
 50 \\
 -49 \\
 \hline
 10 \\
 -7 \\
 \hline
 30 \\
 -28 \\
 \hline
 02
 \end{array}$$

$\frac{3}{7} = 0.4285714 \dots$
 (Repeating Decimal)
 Fraction

(ii) $\frac{4}{5}$

Sol: $5 \overline{) 4.0}$

$$\begin{array}{r}
 0.8 \\
 5 \overline{) 4.0} \\
 -40 \\
 \hline
 0
 \end{array}$$

$\frac{4}{5} = 0.8$
 non-Repeating

(iii) $\frac{6}{8}$

Sol: $8 \overline{) 6.0}$

$$\begin{array}{r}
 0.75 \\
 8 \overline{) 6.0} \\
 -56 \\
 \hline
 40 \\
 -40 \\
 \hline
 0
 \end{array}$$

$\frac{6}{8} = 0.75$
 non-Repeating

(iv) $\frac{11}{12}$

Sol: $12 \overline{) 11.0000}$

$$\begin{array}{r}
 0.9166 \\
 12 \overline{) 11.0000} \\
 -108 \\
 \hline
 20 \\
 -12 \\
 \hline
 80 \\
 72 \\
 \hline
 8
 \end{array}$$

$$\begin{array}{r}
 0.9166 \\
 12 \overline{) 11.0000} \\
 -108 \\
 \hline
 20 \\
 -12 \\
 \hline
 80 \\
 72 \\
 \hline
 8
 \end{array}$$

$\frac{11}{12} = 0.9166$
 Repeating

$$(iv) \frac{2}{7}$$

$$\text{Sol: } 7 \overline{) 2.0000000}$$
$$\begin{array}{r} -14 \\ \hline 60 \\ -56 \\ \hline 40 \\ -35 \\ \hline 50 \\ -49 \\ \hline 10 \end{array}$$

$$\frac{2}{7} = 0.28571428\ldots$$

$$\text{(non-terminating)}$$
$$\begin{array}{r} 20 \\ -14 \\ \hline 60 \\ -56 \\ \hline 04 \end{array}$$

$$(v) \frac{3}{8}$$

$$\text{Sol: } 8 \overline{) 3.000}$$
$$\begin{array}{r} -24 \\ \hline 60 \\ -56 \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

(Terminating)

$$(vi) \frac{8}{5}$$

$$5 \overline{) 8.0}$$
$$\begin{array}{r} -5 \\ \hline 30 \\ -30 \\ \hline 0 \end{array}$$

$$\frac{8}{5} = 1.6$$

(Terminating)

2. Convert Following rational numbers/Fractions and Separate repeating and non-repeating decimal

$$(ix) \frac{13}{4}$$

Sol:
$$\begin{array}{r} 3.25 \\ 4 \overline{) 13.00} \\ \underline{-12} \\ 10 \\ \underline{-08} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

$$\frac{13}{4} = 3.25 \text{ (non-Repeating)}$$

$$(x) \frac{21}{6}$$

$$\begin{array}{r} 3.5 \\ 6 \overline{) 21.0} \\ \underline{-18} \\ -30 \\ \underline{-30} \\ 0 \end{array}$$

$$\frac{21}{6} = 3.5 \text{ non-Repeating}$$

$$(xi) \frac{29}{2}$$

$$\begin{array}{r} 14.5 \\ 2 \overline{) 29} \\ \underline{-2} \\ 09 \\ \underline{-08} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

$$\frac{29}{2} = 14.5 \text{ (non-Repeating)}$$

$$(xii) \frac{10}{3}$$

$$\begin{array}{r} 3.3 \\ 3 \overline{) 10.0} \\ \underline{-09} \\ 10 \\ \underline{-09} \\ 1 \end{array}$$

$$\frac{10}{3} = 3.3 \dots \text{ Repeating}$$

$$(vi) \frac{8}{9}$$

Sol.

$$\begin{array}{r} 0.88 \\ 9 \overline{) 8.00} \\ \underline{-72} \\ 80 \\ \underline{-72} \\ 08 \end{array}$$

$$\frac{8}{9} = 0.88\text{--- (Repeating)}$$

$$(vii) \frac{25}{8}$$

$$\begin{array}{r} 3.125 \\ 8 \overline{) 25.000} \\ \underline{-24} \\ 10 \\ \underline{-08} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

$$(viii) \frac{22}{7}$$

$$\begin{array}{r} 3.1428571 \\ 7 \overline{) 22.0000000} \\ \underline{-21} \end{array}$$

$$\begin{array}{r} 10 \\ \underline{-07} \\ 30 \\ \underline{-28} \\ 20 \\ \underline{-14} \\ 60 \\ \underline{-56} \\ 040 \\ \underline{-35} \end{array}$$

$$\frac{22}{7} = 3.1428571\text{---}$$

(Repeating)

$$\begin{array}{r} 50 \\ \underline{-49} \\ 10 \\ \underline{-7} \\ 3 \end{array}$$

Exercise 2.3

(solution)

1) Find Square Root by Factorization.

i) 784

sol.

2	784
2	392
2	196
2	98
7	49
7	7
	1

$$\sqrt{784} = \sqrt{2 \times 2 \times 2 \times 2 \times 7 \times 7}$$

$$\sqrt{784} = \sqrt{2 \times 2 \times 2 \times 2 \times 7 \times 7}$$

$$= \sqrt{2^2 \times 2^2 \times 7^2}$$

$$\sqrt{784} = 2 \times 2 \times 7$$

$$\sqrt{784} = 28$$

(ii) 1225

5	1225
5	245
7	49
7	7
	1

$$\sqrt{1225} = \sqrt{5 \times 5 \times 7 \times 7}$$

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

$$= \sqrt{5^2 \times 7^2}$$

$$\sqrt{1225} = 5 \times 7$$

$$= 35$$

(iii) 2916

2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

$$\sqrt{2916} = \sqrt{2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3}$$

$$\sqrt{2916} = \sqrt{2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3}$$

$$= \sqrt{2^2 \times 3^2 \times 3^2 \times 3^2}$$

$$= 2 \times 3 \times 3 \times 3$$

$$\sqrt{2916} = 54$$

Exercise #2.2 (Solution)

(1). Find Squares

(i) - 7

Sol: $7 \times 7 = 49$ (Do Simple

(ii) - 11

Sol: $11 \times 11 = 121$ Multiplication)

(iii) - 19

Sol: $19 \times 19 = 361$

(iv) - 25

Sol: $25 \times 25 = 625$

(v) - 37

Sol: $37 \times 37 = 1369$

(vi) - 75

$75 \times 75 = 5625$

2) Write pattern of Summation

(i) 6^2

Sol: $6^2 = 1 + 2 + 3 + 4 + 5 + 6 + 5 + 4 + 3 + 2 + 1$

(ii) 7^2

Sol: $7^2 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 6 + 5 + 4 + 3 + 2 + 1$

(iii) 4^2

Sol: $4^2 = 1 + 2 + 3 + 4 + 3 + 2 + 1$

(iv) 5^2

Sol: $5^2 = 1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1$

(v) 3^2

Sol: $3^2 = 1 + 2 + 3 + 2 + 1$

(vi) 8^2

Sol: $8^2 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1$

(iv) 4225

5	4225
5	845
13	169
13	13
	1

$$\begin{aligned}\sqrt{4225} &= \sqrt{5 \times 5 \times 13 \times 13} \\ &= \sqrt{5 \times 5 \times 13 \times 13} \\ &= \sqrt{5^2 \times 13^2} \\ &= 5 \times 13\end{aligned}$$

$$\sqrt{4225} = 65$$

(v) 5184

2	5184
2	2592
2	1296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

$$\sqrt{5184} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3}$$

$$\sqrt{5184} = \sqrt{2^2 \times 2^2 \times 2^2 \times 2^2 \times 2^2 \times 3^2 \times 3^2}$$

$$= \sqrt{2^2 \times 2^2 \times 2^2 \times 3^2 \times 3^2}$$

$$= 2 \times 2 \times 2 \times 3 \times 3$$

$$\sqrt{5184} = 72$$

(vi) 7744

2	7744
2	3872
2	1936
2	968

Repeated-step

2	968
2	484
2	242
11	22
11	11
	1

$$\begin{array}{r}
 \text{iv} \quad 3 \overline{) 418609} \\
 \underline{-36111} \\
 124 \quad \underline{586} \\
 1287 \quad \underline{-496} \\
 \quad \quad \underline{9009} \\
 \quad \quad \underline{-9009} \\
 \quad \quad \quad \underline{\quad} \\
 \quad \quad \quad \quad \alpha
 \end{array}$$

$$\sqrt{418609} = 647$$

$$\begin{array}{r}
 \text{(v)} \quad 2 \overline{) 49729} \\
 \underline{-4111} \\
 42 \quad \underline{97} \\
 443 \quad \underline{-84} \\
 \quad \quad \underline{1329} \\
 \quad \quad \underline{-1329} \\
 \quad \quad \quad \underline{\quad} \\
 \quad \quad \quad \quad 0
 \end{array}$$

$$\sqrt{49729} = 223$$

$$\begin{array}{r}
 \text{(vi)} \quad 2 \overline{) 55696} \\
 \underline{-4111} \\
 43 \quad \underline{156} \\
 466 \quad \underline{-129} \\
 \quad \quad \underline{2796} \\
 \quad \quad \underline{2796} \\
 \quad \quad \quad \underline{\quad} \\
 \quad \quad \quad \quad 0
 \end{array}$$

$$\sqrt{55696} = 236$$

$$\begin{array}{r}
 \text{(viii)} \quad 3 \overline{) 10329796} \\
 \underline{\quad 9} \\
 62 \quad \underline{132} \\
 \quad \underline{-124} \\
 \quad \quad \underline{897} \\
 \quad \quad \underline{-641} \\
 \quad \quad \quad \underline{25696} \\
 \quad \quad \quad \underline{-25696} \\
 \quad \quad \quad \quad \underline{\quad} \\
 \quad \quad \quad \quad \quad 0
 \end{array}$$

$$\sqrt{10329796} = 3214$$

$$\sqrt{7244} = \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 11 \times 11}$$

$$= \sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 11 \times 11}$$

$$= \sqrt{2^2 \times 2^2 \times 2^2 \times 11^2}$$

$$\sqrt{7244} = 2 \times 2 \times 2 \times 11 = 88$$

(vii) 1296

$$\begin{array}{r|l} 2 & 1296 \\ \hline 2 & 648 \\ 18 & 324 \\ \hline 18 & 18 \\ \hline & 1 \end{array}$$

$$\sqrt{1296} = \sqrt{2 \times 2 \times 18 \times 18}$$

$$= \sqrt{2^2 \times 18^2}$$

$$= 2 \times 18$$

$$\sqrt{1296} = 36$$

(viii) 1764

$$\begin{array}{r|l} 2 & 1764 \\ \hline 2 & 882 \\ 3 & 441 \\ \hline 3 & 147 \\ 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\sqrt{1764} = \sqrt{2 \times 2 \times 3 \times 3 \times 7 \times 7}$$

$$= \sqrt{2 \times 2 \times 3 \times 3 \times 7 \times 7}$$

$$= \sqrt{2^2 \times 3^2 \times 7^2}$$

$$= 2 \times 3 \times 7$$

$$\sqrt{1764} = 42$$

1 (ix) 29241

3	29241
3	9747
3	3249
3	1083
19	361
19	19
	1

$$29241 = \sqrt{3 \times 3 \times 3 \times 3 \times 19 \times 19}$$
$$= \sqrt{3^2 \times 3^2 \times 19^2}$$
$$= \sqrt{3 \times 3 \times 19 \times 19 \times 3 \times 3}$$
$$= 3 \times 3 \times 19$$

$$\sqrt{29241} = 171$$

2) Find Square Root by

Division Method?

(i) $\sqrt{13689} = 117$

3	13689
	-111
21	36
	-21
227	1589
	-1589
	0

(ii) $\sqrt{29241} = 171$

1	29241
	-1
27	192
	189
341	341
	-341
	0

(iii) $\sqrt{103041} = 321$

3	103041
	-9
62	130
	-124
641	641
	-641
	0