



Exercise 1.4

Answer :

$$(i) \quad \frac{13}{3125} = 0.00416$$
$$3125 \overline{) 13.00000}$$
$$\begin{array}{r} 0.00416 \\ 3125 \overline{) 13.00000} \\ \underline{0} \\ 130 \\ \underline{0} \\ 1300 \\ \underline{0} \\ 13000 \\ \underline{12500} \\ 5000 \\ 3125 \\ \underline{18750} \\ 18750 \\ \underline{ \times} \end{array}$$

$$(ii) \quad \frac{17}{8} = 2.125$$
$$8 \overline{) 17}$$
$$\begin{array}{r} 2.125 \\ 8 \overline{) 17} \\ \underline{16} \\ 10 \\ 8 \\ \underline{20} \\ 16 \\ \underline{40} \\ 40 \\ \underline{ \times} \end{array}$$

$$(iv) \quad \frac{15}{1600} = 0.009375$$

$$\begin{array}{r}
 0.009375 \\
 1600 \overline{) 15.000000} \\
 \underline{0} \\
 150 \\
 \underline{0} \\
 1500 \\
 \underline{0} \\
 15000 \\
 \underline{14400} \\
 6000 \\
 \underline{4800} \\
 12000 \\
 \underline{11200} \\
 8000 \\
 \underline{8000} \\
 \times
 \end{array}$$

$$(vi) \quad \frac{23}{2^3 \times 5^2} = \frac{23}{200} = 0.115$$

$$\begin{array}{r}
 0.115 \\
 200 \overline{) 23.000} \\
 \underline{0} \\
 230 \\
 \underline{200} \\
 300 \\
 \underline{200} \\
 1000 \\
 \underline{1000} \\
 \times
 \end{array}$$

$$(viii) \frac{6}{15} = \frac{2 \times 3}{3 \times 5} = \frac{2}{5} = 0.4$$

$$\begin{array}{r} 0.4 \\ 5 \overline{) 2.0} \\ 0 \\ \hline 20 \\ 20 \\ \hline \times \\ \hline \end{array}$$

$$(ix) \quad \frac{35}{50} = 0.7$$

$$\begin{array}{r} 0.7 \\ 50 \overline{) 35.0} \\ 0 \\ \hline 350 \\ 350 \\ \hline \times \\ \hline \end{array}$$

Q 3. The following real numbers have decimal expansions as given below. In each case, decide whether they are rational or not. If they are rational, and of the form $\frac{p}{q}$, what can you say about the prime factor of q ?

- (i) 43.123456789 (ii) 0.120120012000120000...
(iii) $\overline{43.123456789}$

Answer :

- (i) 43.123456789

Since this number has a terminating decimal expansion, it is a rational number of the form $\frac{p}{q}$ and q is of the form $2^m \times 5^n$

i.e., the prime factors of q will be either 2 or 5 or both.

- (ii) 0.120120012000120000 ...

The decimal expansion is neither terminating nor recurring. Therefore, the given number is an irrational number.

- (iii) $\overline{43.123456789}$

Since the decimal expansion is non-terminating recurring, the given number is a rational number of the form $\frac{p}{q}$ and q is not of the form $2^m \times 5^n$

i.e., the prime factors of q will also have a factor other than 2 or 5.

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