

Exercise – 1.2

Express the following rational numbers as decimals:

1.

Sol:

(i) By long division, we have

$$\begin{array}{r} 100 \overline{) 42.00} \quad 0.42 \\ \underline{400} \\ 200 \\ \underline{200} \\ 0 \end{array}$$

$$\therefore \boxed{\frac{42}{100} = 0.42}$$

(ii) By long division, we have

$$\begin{array}{r} 500 \overline{) 327.000} \quad 0.654 \\ \underline{3000} \\ 2700 \\ \underline{2500} \\ 2000 \\ \underline{2000} \\ 0 \end{array}$$

$$\therefore \boxed{\frac{327}{500} = 0.654}$$

(iii) By long division, we have

$$\begin{array}{r} 4 \overline{) 15.00} \quad 3.75 \\ \underline{12} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

$$\therefore \boxed{\frac{15}{4} = 3.75}$$

2.

Sol:

(i) By long division, we have

$$\begin{array}{r} 3 \overline{) 2.0000} \quad 0.6666 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

$$\therefore \frac{2}{3} = 0.6666\dots = 0.\overline{6}$$

(ii) By long division, we have

$$\begin{array}{r} 9 \overline{) 4.0000} \quad 0.4444 \\ \underline{36} \\ 40 \\ \underline{36} \\ 40 \\ \underline{36} \\ 40 \\ \underline{36} \\ 4 \end{array}$$

$$\therefore \frac{4}{9} = 0.4444\dots = 0.\overline{4}$$

Hence, $\frac{4}{9} = 0.\overline{4}$

(iii) By long division, we have

$$\begin{array}{r} 5 \overline{) 2.0000} \quad 0.13333 \\ \underline{15} \\ 50 \\ \underline{45} \\ 40 \\ \underline{45} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

$$\begin{array}{r} 40 \\ 45 \\ \hline 5 \end{array}$$

$$\therefore \frac{2}{3} = 0.6666\dots = 0.\overline{6}$$

(iv) By long division, we have

$$\begin{array}{r} 13 \overline{)22.0000} \quad 1.692307692307 \\ \underline{-13} \\ 90 \\ \underline{-78} \\ 120 \\ \underline{-117} \\ 30 \\ \underline{-26} \\ 40 \\ \underline{-39} \\ 100 \\ \underline{-91} \\ 90 \\ \underline{-78} \\ 120 \\ \underline{-117} \\ 30 \\ 26 \end{array}$$

$$\therefore \frac{22}{13} = 1.692307692307\dots = 1.\overline{692307} \Rightarrow \frac{22}{13} = 1.\overline{692307}$$

(v) By long division, we have

$$\begin{array}{r} 999 \overline{)437.000000} \quad 0.437437 \\ \underline{3996} \\ 3740 \\ \underline{2997} \\ 7430 \\ \underline{6993} \\ 4370 \end{array}$$

$$\begin{array}{r}
 3996 \\
 \hline
 3740 \\
 2997 \\
 \hline
 7430 \\
 6993 \\
 \hline
 4370
 \end{array}$$

$$\therefore \frac{437}{999} = 0.437437\text{.....} = \overline{0.437}$$

(vi) By long division, we have

$$26 \overline{)33.000000000000} \quad 1.2692307692307$$

$$\begin{array}{r}
 26 \\
 \hline
 70 \\
 \underline{-52} \\
 180 \\
 \underline{-156} \\
 240 \\
 \underline{-234} \\
 60 \\
 \underline{-52} \\
 80 \\
 \underline{-78} \\
 200 \\
 \underline{-182} \\
 180 \\
 \underline{-156} \\
 240 \\
 \underline{-234} \\
 60 \\
 \underline{-52} \\
 80 \\
 \underline{-78} \\
 200 \\
 \underline{-182} \\
 18
 \end{array}$$

$$\therefore \frac{33}{26} = 1.2692307698307\text{.....} = \overline{1.2692307}$$

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3.

Sol:

A rational number $\frac{p}{q}$ is a terminating decimal only, when prime factors of q are 2 and 5

only. Therefore, $\frac{p}{q}$ is a terminating decimal only, when prime factorization of q must have only powers of 2 or 5 or both.