Exercise 2.1

Q.1 Identity which of the following are rational and irrational numbers?

(i) $\sqrt{3}$ Irrational number

(ii) $\frac{1}{6}$ Rational number

(iii) π Irrational number

(iv) $\frac{15}{2}$ Rational number

(v) 7.25 Rational number

(vi) $\sqrt{29}$ Irrational number

Q.2 Convert the following fractions into decimal fractions.

(i) $\frac{17}{25}$

Solution: $\frac{17}{25}$

$$
\begin{array}{r}
0.68 \\
25\overline{)\ 170} \\
-150 \\
\hline
200 \\
-200 \\
\hline
0
\end{array}
$$

$\frac{17}{25} = 0.68$ **Ans**

(ii) $\frac{19}{4}$

Solution: $\frac{19}{4}$

$$
\begin{array}{r}
4.75 \\
4\overline{)19.000} \\
16 \\
\hline
30 \\
28 \\
\hline
20 \\
20 \\
\hline
0
\end{array}
$$

$= \frac{19}{4}$

$= 4.75$ **Ans**

(iii) $\frac{57}{8}$

Solution: $\frac{57}{8}$

$$
\begin{array}{r}
7.125 \\
8\overline{)\ 57} \\
-56 \\
\hline
10 \\
8 \\
\hline
20 \\
-16 \\
\hline
40 \\
40 \\
\hline
0
\end{array}
$$

$= \frac{57}{8}$

$= 7.125$ **Ans**

(iv) $\frac{205}{18}$

Solution: $\frac{205}{18}$

$$
\begin{array}{r}
11.388 \\
18\overline{)205.000} \\
\hline
25
\end{array}
$$

$$
\begin{array}{r}
18 \\
\hline
70 \\
-54 \\
\hline
160 \\
-144 \\
\hline
160 \\
-144 \\
\hline
16
\end{array}
$$

$$\frac{208}{18}$$

$= 11.3888$

$= 11.3889$ **Ans**

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

Solution: $\frac{5}{8}$

$$
\begin{array}{r|l}
8 & .625 \\
\hline
5.000 & \\
48 & \\
\hline
20 & \\
-16 & \\
\hline
40 & \\
-40 & \\
\hline
0 &
\end{array}
$$

$\frac{5}{8}$

$= 0.625$ **Ans**

(vi) $\frac{25}{38}$

Solution: $\frac{25}{38}$

$$
\begin{array}{r|l}
38 & 0.65789... \\
\hline
250 & \\
-228 & \\
\hline
220 & \\
-190 & \\
\hline
300 & \\
-266 & \\
\hline
340 & \\
-304 & \\
\hline
360 & \\
-342 & \\
\hline
18 &
\end{array}
$$

$\frac{25}{38}$

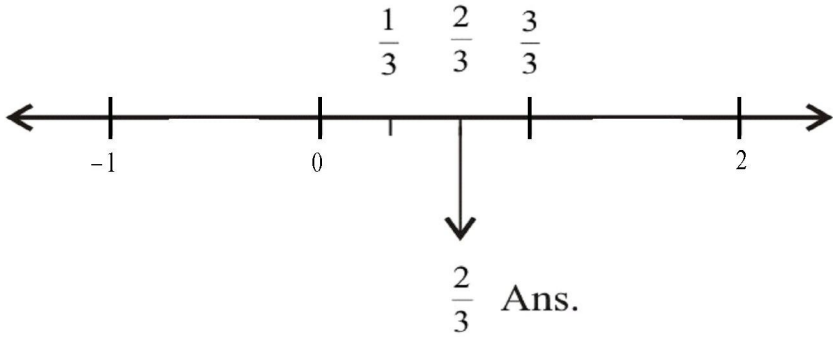
$= 0.65789$ **Ans**

Q.3 Which of the following statements are true and which are false?

(i)	$\frac{2}{3}$ is an irrational number.	False
(ii)	π is an irrational number.	True
(iii)	$\frac{1}{9}$ is a terminating fraction.	False
(iv)	$\frac{3}{4}$ is a terminating fraction.	True
(v)	$\frac{4}{5}$ is a recurring fraction.	False

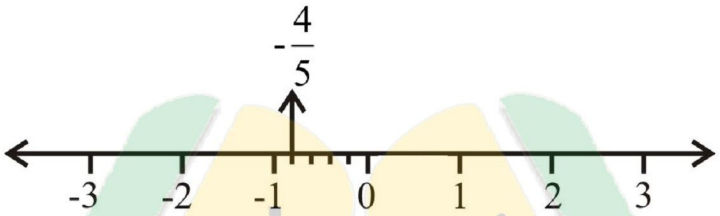
Q.4 Represent the following numbers on the number line.

(i) $\frac{2}{3}$



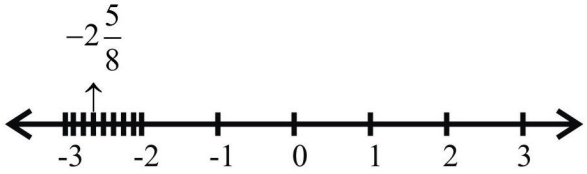
$\frac{2}{3}$ Ans.

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

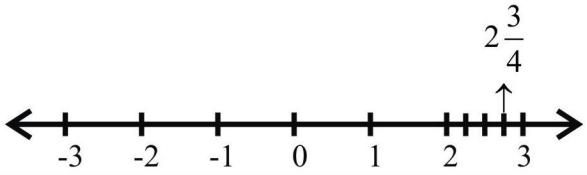


(iii) $1\frac{3}{4}$

(iv) $-2\frac{5}{8}$



(v) $2\frac{3}{4}$



(vi) $\sqrt{5}$

By Pythagoras theorem

$$(\text{Hypoteneus})^2 = (\text{Base})^2 + (\text{Perpencicular})^2$$

$$\left(\overline{OB}\right)^2 = (2)^2 + (1)^2$$

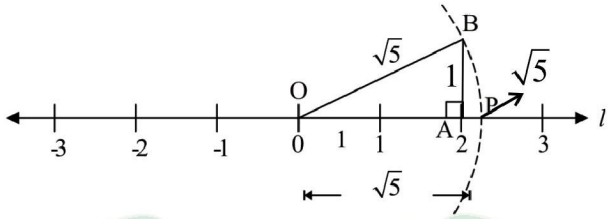
$$\left(\overline{OB}\right)^2 = 4 + 1$$

$$\left(\overline{OB}\right)^2 = 5$$

Taking square root on both sides

$$\sqrt{\left(\overline{OB}\right)^2} = \sqrt{5}$$

$$\overline{OB} = \sqrt{5}$$



Q.5 **Give a rational number between $\frac{3}{4}$ and $\frac{5}{9}$**

Solution:

Required No between

$$\frac{3}{4} \text{ and } \frac{5}{9}$$

$$= \left[\frac{3}{4} + \frac{5}{9}\right] \div 2$$

$$= \left[\frac{27 + 20}{36}\right] \div 2$$

$$= \left[\frac{47}{36}\right] \div 2$$

$$= \frac{47}{36} \times \frac{1}{2}$$

$$= \frac{47}{72} \textbf{ Ans}$$

Q.6 **Express the following recurring decimals as the rational number $\frac{p}{q}$ where p, q are integer and $q \neq 0$.**

(i) $0.\overline{5}$

Solution:

$$x = 0.\overline{5}$$

$$x = 0.555...$$

$$10 \times x = 10 \times 0.555...$$

$$10x = 5.555...$$

$$10x = 5 + 0.555...$$

$$10x = 5 + x$$

$$10x - x = 5$$

$$9x = 5$$

$$x = \frac{5}{9}$$

$$\therefore 0.\overline{5} = \frac{5}{9} \textbf{ Ans}$$

(ii) $0.\overline{13}$

Solutions:

Suppose

$x = 0.\overline{13}$

$x = 0.131313...$

$100^{x}\, x = 100 \times 1.131313...$

$100x = 13.1313...$

$100x = 13 + 0.1313...$

$100x = 13 + x$

$100x - x = 13$

$99x = 13$

$x = \frac{13}{99}$

$\therefore 0.\overline{13} = \frac{13}{99}$ **Ans**

(iii) $0.\overline{67}$

Solutions:

Suppose

$x = 0.\overline{67}$

$x = 0.676767...$

$100 \times x = 100 \times 0.676767...$

$100x = 67.6767...$

$100x = 67 + 0.6767...$

$100x = 67 + x$

$100x - x = 67$

$99x = 67$

$x = \frac{67}{99}$

$\therefore 0.\overline{67} = \frac{67}{99}$ **Ans**

Last Updated: September 2020

Report any mistake at freeilm786@gmail.com