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: $\frac{17}{25}$

$$25\overline{)\,170}\;(0.68$$
$$-150$$
$$200$$
$$-200$$
$$0$$

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

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

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

$$4\overline{)19.000}\;(4.75$$
$$16$$
$$30$$
$$28$$
$$20$$
$$20$$
$$0$$

$= \frac{19}{4}$

$= 4.75$ **Ans**

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

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

$$8\overline{)\,57}\;(7.125$$
$$-56$$
$$10$$
$$8$$
$$20$$
$$-16$$
$$40$$
$$40$$
$$0$$

$= \frac{57}{8}$

$= 7.125$ **Ans**

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

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

$$18\overline{)205.000}\;(11.388$$
$$25$$

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

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

$$= 11.3888$$

$$= 11.3889 \quad \textbf{Ans}$$

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

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

$$\begin{array}{r} .625 \\ 8\overline{)5.000} \\ 48 \\ \hline 20 \\ -16 \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

$$\frac{5}{8}$$

$$= 0.625 \quad \textbf{Ans}$$

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

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

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

$$\frac{25}{38}$$

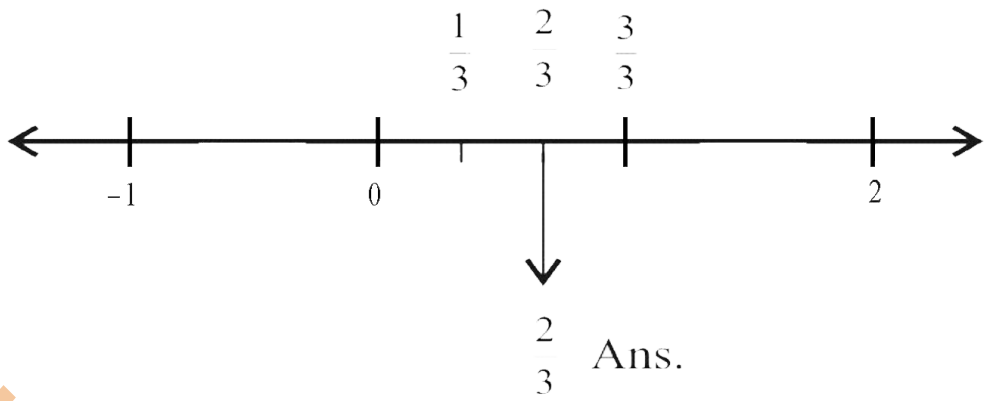
$$= 0.65789 \quad \textbf{Ans}$$

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

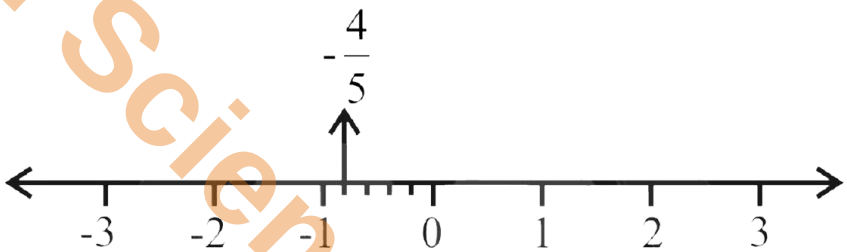
Q.4 Represent the following numbers on the number line.

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

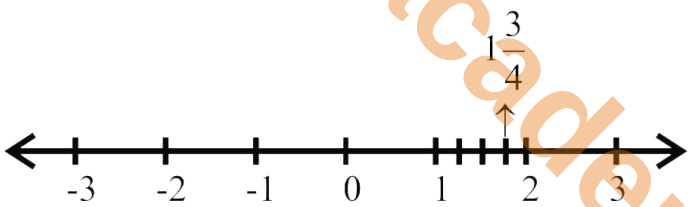


$\frac{2}{3}$ Ans.

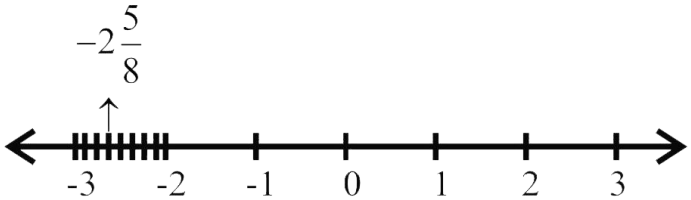
(ii) $-\frac{4}{5}$



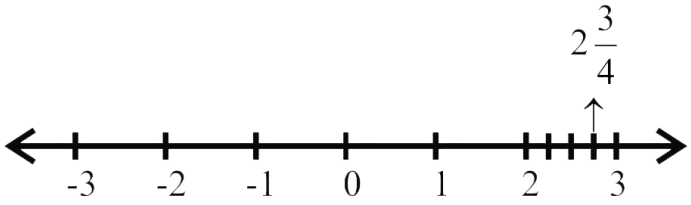
(iii) $1\frac{3}{4}$



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



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



(vi) $\sqrt{5}$

By Pythagoras theorem

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

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

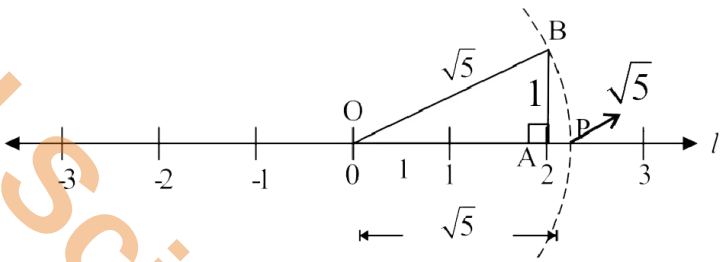
$$(\overline{OB})^2 = 4 + 1$$

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

Taking square root on both sides

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

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



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:

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

$$x = 0.555\ldots$$

$$10 \times x = 10 \times 0.555\ldots$$

$$10x = 5.555\ldots$$

$$10x = 5 + 0.555\ldots$$

$$10x = 5 + x$$

$$10x - x = 5$$

$$9x = 5$$

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

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

(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**