Exercise 2.1

Q. 1: Identify which of the following are rational and irrational numbers.

(i) $\sqrt{3}$ (ii) $\frac{1}{6}$ (iii) π (iv) $\frac{15}{2}$ (v) 7.25 (vi) $\sqrt{29}$

(i) $\sqrt{3} = 1.732050808 \ldots$, cannot be written as $\frac{p}{q}$ form so Irrational.

(ii) $\frac{1}{6}$ is already written as $\frac{p}{q}$ form so rational.

(iii) $\pi = 3.14159 \ldots$, cannot be written as $\frac{p}{q}$ form so Irrational.

(iv) $\frac{15}{2}$ is already written as $\frac{p}{q}$ form so rational.

(v) $7.25 = \frac{725}{100} = \frac{29}{4}$ can be written as $\frac{p}{q}$ form so rational.

(vi) $\sqrt{29} = 5.385164807134503125071049154\,03$, cannot be written as $\frac{p}{q}$ form so Irrational.

Q. 2: Convert the following fractions into decimal fractions.

(i) $\frac{17}{25}$ (ii) $\frac{19}{4}$ (iii) $\frac{57}{8}$ (iv) $\frac{205}{18}$ (v) $\frac{5}{8}$ (vi) $\sqrt{29}$

(i) 0.68 (ii) 4.75 (iii) 7.125 (iv) 11.3889 (v) 0.625 (vi) 0.65789

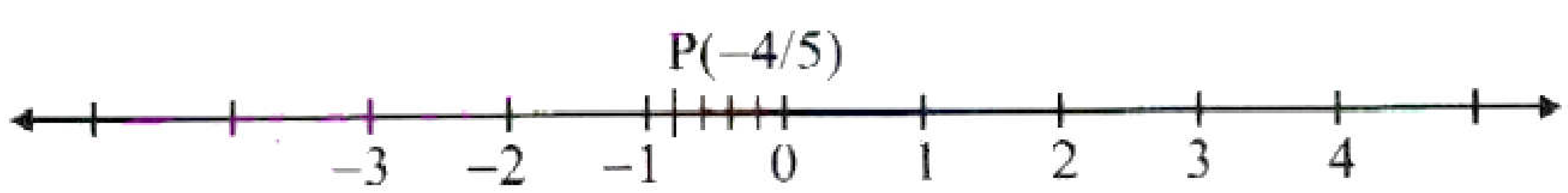
Q. 3: which of the following terms are true and which are false.

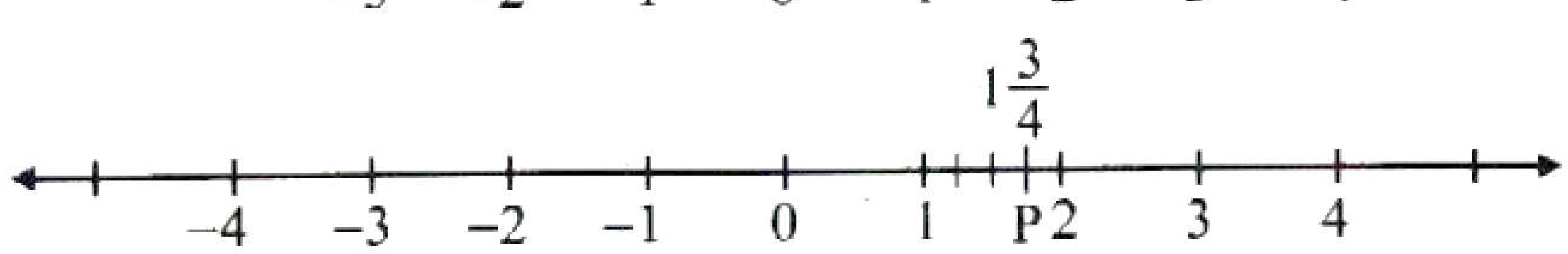
(i)	$\frac{2}{3}$ is an irrational number.	F
(ii)	π is an irrational number.	T
(iii)	$\frac{1}{9}$ is a terminating fraction.	F
(iv)	$\frac{3}{4}$ is a terminating fraction.	T
(v)	$\frac{5}{8}$ is a recurring fraction.	F

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

(i) $\frac{2}{3}$ (ii) $-\frac{4}{5}$ (iii) $1\frac{3}{4}$ (iv) $-2\frac{5}{8}$ (v) $2\frac{3}{4}$ (vi) $\sqrt{5}$

(i)


(ii)


(iii)


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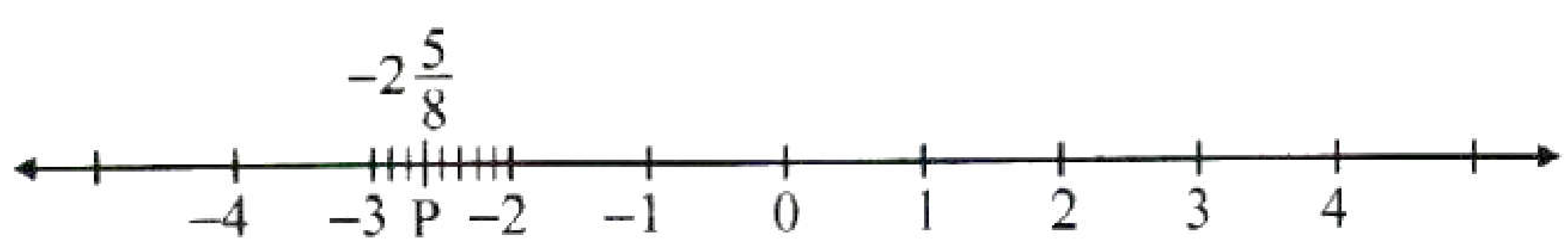
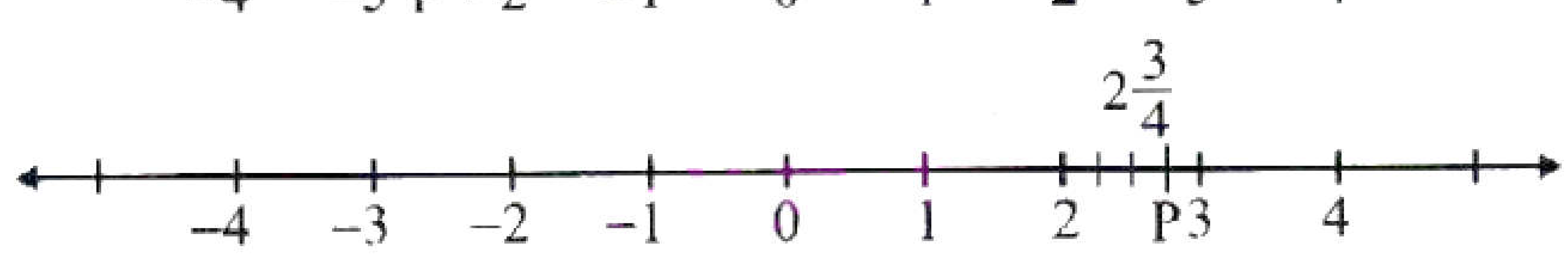
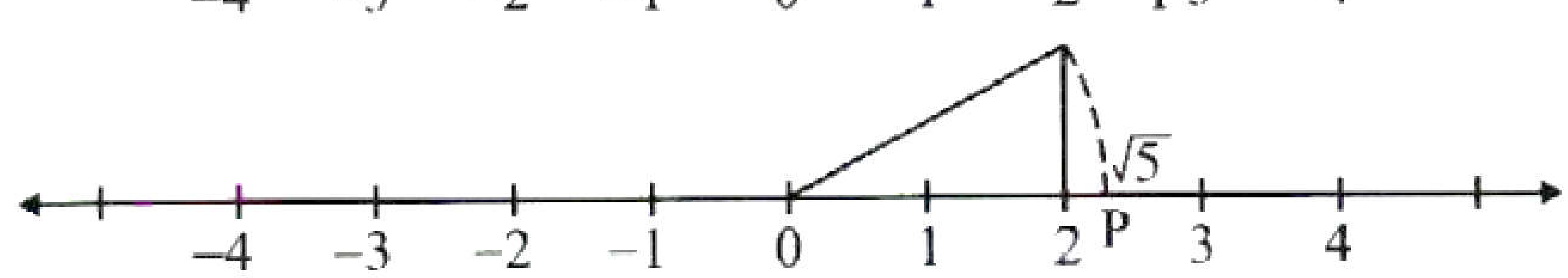


(v)


(vi)


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

let $x = \frac{3}{4}$ and $y = \frac{5}{9}$, then a number z exists between x and y such that $z = \frac{x+y}{2}$

So,

$$z = \frac{x+y}{2}$$
$$= \frac{\frac{3}{4}+\frac{5}{9}}{2}$$
$$= \frac{\frac{27+20}{36}}{2}$$
$$= \frac{47}{72}$$

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

(i) $0.\overline{5}$ (ii) $0.\overline{13}$ (iii) $0.\overline{67}$

(i) Let x = $0.\overline{5}$, which can be rewritten as

x = $0.55555 \ldots$ --- (i)

We have only one digit 5 repeating itself indefinitely, So we multiply both sides by 10

$10x$ = $(0.55555 \ldots) \times 10$

$10x$ = $5.55555 \ldots$ --- (ii)

Subtracting equation (i) from (ii)

$10x - x$ = $(5.55555 \ldots) - (0.55555 \ldots)$

$9x$ = 5

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

(ii) Let x = $0.\overline{13}$, which can be rewritten as

x = $0.131313 \ldots$ --- (i)

We have two digits 13 repeating indefinitely, So we multiply both sides by 100

$100x$ = $(0.131313 \ldots) \times 100$

$100x$ = $13.1313 \ldots$ --- (ii)

Subtracting equation (i) from (ii)

$100x - x$ = $(13.1313 \ldots) - (0.131313 \ldots)$

$99x$ = 13

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

(iii) Let x = $0.\overline{67}$, which can be rewritten as

x = $0.676767 \ldots$ --- (i)

We have two digits 67 repeating indefinitely, So we multiply both sides by 100

$100x$ = $(0.676767 \ldots) \times 100$

$100x$ = $67.6767 \ldots$ --- (ii)

Subtracting equation (i) from (ii)

$100x - x$ = $(67.6767 \ldots) - (0.676767 \ldots)$

$99x$ = 67

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