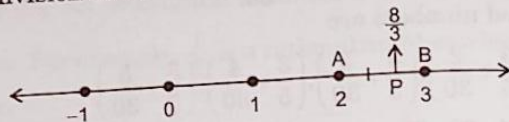


Then, P represents the number $1\frac{1}{6} (= \frac{7}{6})$.

$$(ii) \frac{8}{3} = 2\frac{2}{3}, \quad \therefore 2 < \frac{8}{3} < 3.$$

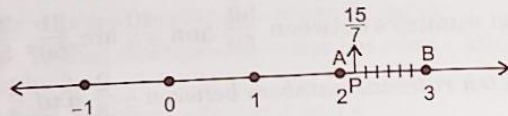
On the following number line the point A represents 2 and the point represents 3. Divide the line segment AB into three equal parts. Name the second point of division as P.



Then, P represents the rational number $2\frac{2}{3} (= \frac{8}{3})$.

$$(iii) \frac{15}{7} = 2\frac{1}{7}, \quad \therefore 2 < \frac{15}{7} < 3.$$

On the following number line the point A represents 2 and the point represents 3. Divide the line segment AB into seven equal parts. Name the first point of division as P.



Then, P represents the number $2\frac{1}{7} (= \frac{15}{7})$.

Exercise 1.1

1. Which of the following numbers are:

$$\left\{ 7, \frac{3}{2}, -\frac{9}{5}, -8, 0, 2, \frac{1}{4} \right\}$$

- (i) natural numbers? (ii) whole numbers?
(iii) integers? (iv) rational numbers?

2. (i) Write the greatest negative integer.

(ii) Write the multiplicative inverse of $\frac{3}{7}$.

(iii) Write the additive inverse of $\frac{5}{8}$.

(iv) Write the natural number whose successor is 23.

(v) Write the integer which separates the positive integers from negative integers.

(vi) Which rational number does not have a reciprocal?

3. Which of the following statements are true or false?

(i) Natural numbers are commutative in subtraction.

(ii) The smallest whole number is 1.

(iii) Every rational number is an integer.

(iv) Every integer is a rational number.

(v) The additive inverse of $\frac{2}{5}$ is $\frac{5}{2}$.

(vi) The difference of two rational numbers is always rational.

4. Fill in the blanks.

(i) There are many rational numbers between any two given rational numbers.

(ii) Every number is a whole number.

(iii) All counting numbers together with 0 form the set of numbers.

(iv) All natural numbers together with 0 and negatives of all the counting numbers form the set of

(v) The two rational numbers which are their own multiplicative inverses are

(vi) Every rational number is represented by one and only one on the number line.

5. Insert a rational number between $\frac{3}{5}$ and $\frac{5}{7}$.

6. Find five rational numbers between 1 and 2.

7. Find two rational numbers between $\frac{1}{2}$ and $\frac{3}{4}$.

8. Find three rational numbers between $\frac{1}{5}$ and $\frac{1}{3}$.

9. (i) Find three rational numbers between $-\frac{2}{5}$ and $-\frac{1}{5}$.

(ii) Find eight rational numbers between $\frac{1}{4}$ and $\frac{1}{3}$.

10. Represent the following rational numbers on the number line:

(i) $\frac{13}{10}$

(ii) $\frac{11}{4}$

(iii) $\frac{25}{8}$

Answers

1. (i) {2, 7} (ii) {0, 2, 7} (iii) {-8, 0, 2, 7}

(iv) $\{-8, -\frac{9}{5}, 0, \frac{1}{4}, \frac{3}{2}, 2, 7\}$

2. (i) -1 (ii) $\frac{7}{3}$ (iii) $-\frac{5}{8}$ (iv) 22

(v) 0 (vi) 0

3. (i) False (ii) False (iii) False (iv) True

(v) False (vi) True

4. (i) infinitely (ii) natural (iii) whole (iv) integers

(v) {1 and -1} (vi) point

Answers

1. (i) $\{2, 7\}$ (ii) $\{0, 2, 7\}$ (iii) $\{-8, 0, 2, 7\}$

(iv) $\{-8, -\frac{9}{5}, 0, \frac{1}{4}, \frac{3}{2}, 2, 7\}$

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2. (i) -1 (ii) $\frac{7}{3}$ (iii) $-\frac{5}{8}$ (iv) 22

(v) 0 (vi) 0

3. (i) False (ii) False (iii) False (iv) True

(v) False (vi) True

4. (i) infinitely (ii) natural (iii) whole (iv) integers
(v) $\{1 \text{ and } -1\}$ (vi) point

5. $\frac{23}{35}$

8. $\frac{7}{30}, \frac{4}{15}, \frac{3}{10}$

6. $\frac{7}{6}, \frac{4}{3}, \frac{3}{2}, \frac{5}{3}$ and $\frac{11}{6}$

7. $\frac{5}{8}, \frac{9}{16}$

9. (i) $-\frac{7}{20}, -\frac{6}{20}, -\frac{5}{20}$

(ii) $\frac{28}{108}, \frac{29}{108}, \frac{30}{108}, \frac{31}{108}, \frac{32}{108}, \frac{33}{108}, \frac{34}{108}, \frac{35}{108}$