

NUMBER SYSTEMS

EXERCISE 1.1

Q.1. Is zero a rational number? Can you write it in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$?

Sol. Yes, zero is a rational number. It can be written as $\frac{0}{1}, \frac{0}{2}$, etc., in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. **Ans.**

Q.2. Find six rational numbers between 3 and 4.

Sol. To find six rational numbers between 3 and 4 denominator should be made equal to $6 + 1 = 7$.

$$\text{Therefore, } 3 = \frac{3 \times 7}{7} = \frac{21}{7} \quad 4 = \frac{4 \times 7}{7} = \frac{28}{7}$$

Six rational numbers between 3 and 4 can be found by varying the numerator between 21 and 28.

Or, the numbers are $\frac{22}{7}, \frac{23}{7}, \frac{24}{7}, \frac{25}{7}, \frac{26}{7}, \frac{27}{7}$. **Ans.**

Q.3. Find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$.

Sol. To find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$, we may add the given numbers and divide by 2, and repeat the process.

$$\frac{\frac{3}{5} + \frac{4}{5}}{2} = \frac{7}{5 \times 2} = \frac{7}{10} = x_1$$

$$\frac{\frac{7}{10} + \frac{4}{5}}{2} = \frac{7+8}{10} = \frac{15}{10}$$

$$\text{Next rational number} = \frac{15}{10 \times 2} = \frac{15}{20} = \frac{3}{4} = x_2$$

$$\frac{\frac{3}{4} + \frac{4}{5}}{2} = \frac{15+16}{20} = \frac{31}{20}$$

$$\text{Next rational number} = \frac{31}{20 \times 2} = \frac{31}{40} = x_3$$

$$\frac{\frac{31}{40} + \frac{4}{5}}{2} = \frac{31+32}{40} = \frac{63}{40}$$

$$\text{Next rational number} = \frac{63}{40 \times 2} = \frac{63}{80} = x_4$$

$$\frac{\frac{63}{80} + \frac{4}{5}}{2} = \frac{63+64}{80} = \frac{127}{80}$$

$$\text{Next rational number} = \frac{127}{80 \times 2} = \frac{127}{160} = x_5$$

