RD Sharma Solutions for Chapter 1 - Number System

Exercise-1.1

1. SOLUTION:

Yes zero is a rational number as it can be represented in

the $\dfrac{p}{q}$ form, where p and q are integers and q $\neq$ 0 as $\dfrac{0}{1}$ or $\dfrac{0}{2}$ or $\dfrac{0}{3}$ etc.

Concept Insight: Key idea to answer this question is "every integer is a rational number and zero is a non negative integer". Also 0 can be

expressed in $\dfrac{p}{q}$ form in various ways as 0 divided by any number is 0.

simplest is $\dfrac{0}{1}$.

2. SOLUTION:

Given that to find out 5 rational numbers between 1 and 2

Rational number lying between 1 and 2

$$= \dfrac{1+2}{2}$$

= 3/2

= 1 < 3/2 < 2

Rational number lying between 1 and 3/2

$$= \frac{1 + \frac{3}{2}}{2}$$

= 5/4

= 1 < 5/4 < 3/2

Rational number lying between 1 and 5/4

$$= \frac{1 + \frac{5}{4}}{2}$$

Rational number lying between 3/2 and 2

= 9/8

= 1 < 9/8 < 5/4

Rational number lying between 3/2 and 2

$$= \frac{\frac{3}{2} + 2}{2}$$

= 7/4

= 3/2 < 7/4 < 2

Rational number lying between 7/4 and 2

$$= \frac{\frac{7}{4} + 2}{2}$$

= 15/8

= 7/4 < 15/8 < 2

Therefore, 1 < 9/8 < 5/4 < 3/2 < 7/4 < 15/8 < 2

3. SOLUTION:

Given that to find out 6 rational numbers between 3 and 4

We have,

3 × 7/7 = 21/7 and

4 × 6/6 = 28/7

We know 21 < 22 < 23 < 24 < 25 < 26 < 27 < 28

21/7 < 22/7 < 23/7 < 24/7 < 25/7 < 26/7 < 27/7 < 28/7

3 < 22/7 < 23/7 < 24/7 < 25/7 < 26/7 < 27/7 < 4

Therefore, 6 rational numbers between 3 and 4 are

22/7, 23/7, 24/7, 25/7, 26/7, 27/7

Similarly to find 5 rational numbers between 3 and 4, multiply 3 and 4 respectively with 6/6 and in order to find 8 rational numbers between 3 and 4 multiply 3 and 4 respectively with 8/8 and so on.

4. SOLUTION:

Given to find out the 5 rational numbers between 3/5 and 4/5

To find 5 rational numbers between 3/5 and 4/5, 3/5 and 4/5 with 6/6

We have,

3/5 × 6/6 = 18/30

4/5 × 6/6 = 24/30

We know 18 < 19 < 20 < 21 < 22 < 23 < 24

18/30 < 19/30 < 20/30 < 21/30 < 22/30 < 23/30 < 24/30

3/5 < 1930 < 20/30 < 21/30 < 22/30 < 23/30 < 4/5

Therefore, 5 rational numbers between 3/5 and 4/5 are 19/30, 20/30, 21/30, 22/30, 23/30

5. SOLUTION:

(i) False

(ii) True

(iii) False

(iv)True

(v) False

(vi) False