

Exercise 1A

Q9

(i) We will first write each of the given numbers with positive denominators. We have:

$$\frac{8}{-3} = \frac{8 \times (-1)}{-3 \times (-1)} = \frac{-8}{3}$$

Thus, the given numbers are $-2,\ \frac{-13}{6}\ ,\ \frac{-8}{3}\ \ {\rm and}\ \ \frac{1}{3}$

LCM of 1, 6, 3 and 3 is 6

Now.

$$\frac{-2}{1} = \frac{-2 \times 6}{1 \times 6} = \frac{-12}{6}$$

$$\frac{-13}{6} = \frac{-13 \times 1}{6 \times 1} = \frac{-13}{6}$$

$$\frac{-8}{3} = \frac{-8 \times 2}{3 \times 2} = \frac{-16}{6}$$

and

$$\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

Clearly, Thus,

$$\frac{2}{6} > \frac{-12}{6} > \frac{-13}{6} > \frac{-16}{6}$$

$$\because \frac{1}{3} > -2 > \frac{-13}{6} > \frac{-8}{3}$$
 , i.e $\frac{1}{3} > -2 > \frac{-13}{6} > \frac{8}{-3}$

(ii) We will first write each of the given numbers with positive denominators. We have:

$$\frac{7}{-15} = \frac{7 \times (-1)}{-15 \times (-1)} = \frac{-7}{15}$$
 and $\frac{17}{-30} = \frac{17 \times (-1)}{-30 \times (-1)} = \frac{-17}{30}$

Thus, the given numbers are $\frac{-3}{10}$, $\frac{-7}{15}$, $\frac{-11}{20}$ and $\frac{-17}{30}$

LCM of 10, 15, 20 and 30 is 60

Now

$$\frac{-3}{10} = \frac{-3 \times 6}{10 \times 6} = \frac{-18}{60}$$

$$\frac{-7}{15} = \frac{-7 \times 4}{15 \times 4} = \frac{-28}{60}$$

$$\frac{-11}{20} = \frac{-11 \times 3}{20 \times 3} = \frac{-33}{60}$$

and

$$\frac{-17}{30} = \frac{-17 \times 2}{30 \times 2} = \frac{-34}{60}$$

Clearly,

$$\frac{-18}{60} > \frac{-28}{60} > \frac{-33}{60} > \frac{-34}{60}$$

$$\therefore \tfrac{-3}{10} > \tfrac{-7}{15} > \tfrac{-11}{20} > \tfrac{-17}{30} \text{. i.e } \tfrac{-3}{10} > \tfrac{7}{-15} > \tfrac{-11}{20} > \tfrac{17}{-30}$$

(iii) We will first write each of the given numbers with positive denominators. We have:

$$\frac{23}{-24} = \frac{23 \times (-1)}{-24 \times (-1)} = \frac{-23}{24}$$

Thus, the given numbers are $\frac{-5}{6}$, $\frac{-7}{12}$, $\frac{-13}{18}$ and $\frac{-23}{24}$

LCM of 6, 12, 18 and 24 is 72

Now,

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$$\frac{-5}{6} = \frac{-5 \times 12}{6 \times 12} = \frac{-60}{72}$$

$$\frac{-7}{12} = \frac{-7 \times 6}{12 \times 6} = \frac{-42}{72}$$

$$\frac{-13}{18} = \frac{-13 \times 4}{18 \times 4} = \frac{-52}{72}$$

and

$$\frac{-23}{24} = \frac{-23 \times 3}{24 \times 3} = \frac{-69}{72}$$

Clearly,

$$\frac{-42}{72} > \frac{-52}{72} > \frac{-60}{72} > \frac{-69}{72}$$

$$\therefore \frac{-7}{12} > \frac{-13}{18} > \frac{-5}{6} > \frac{-23}{24}$$
 i.e $\frac{-7}{12} > \frac{-13}{18} > \frac{-5}{6} > \frac{23}{-24}$

(iv) The given numbers are $\frac{-10}{11}$, $\frac{-19}{22}$, $\frac{-23}{33}$ and $\frac{-39}{44}$

LCM of 11, 22, 33 and 44 is 132

Now.

$$\frac{-10}{11} = \frac{-10 \times 12}{11 \times 12} = \frac{-120}{132}$$

$$\frac{-19}{22} = \frac{-19 \times 6}{22 \times 6} = \frac{-114}{132}$$

$$\frac{-23}{33} = \frac{-23 \times 4}{33 \times 4} = \frac{-92}{132}$$

and

$$\frac{-39}{44} = \frac{-39 \times 3}{44 \times 3} = \frac{-117}{132}$$

Clearly,

$$\frac{-92}{132} > \frac{-114}{132} > \frac{-117}{132} > \frac{-120}{132}$$

Q10

Answer:

1. True

A whole number can be expressed as $\frac{a}{b}$, with b=1 and $a\geq 0$. Thus, every whole number is rational.

2. True

Every integer is a rational number because any integer can be expressed as $\frac{a}{b}$, with b=1 and $0>a\geq 0$. Thus, every integer is a rational number.

3 False

 $0=rac{a}{b}$, for a=0 and b
eq 0. Thus, 0 is a rational and whole number.

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