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 $-2,\ \frac{-13}{6},\ \frac{-8}{3}$ and $\frac{1}{3}$

LCM of 1, 6, 3 and 3 is 6

Now,

$$\frac{-2}{1} = \frac{-2\times6}{1\times6} = \frac{-12}{6}$$

$$\frac{-13}{6} = \frac{-13\times1}{6\times1} = \frac{-13}{6}$$

$$\frac{-8}{3} = \frac{-8\times2}{3\times2} = \frac{-16}{6}$$

and

$$\frac{1}{3} = \frac{1\times2}{3\times2} = \frac{2}{6}$$

Clearly,Thus,

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

$\therefore \frac{1}{3} > -2 > \frac{-13}{6} > \frac{-8}{3}$. 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,

$\frac{-3}{10} = \frac{-3\times6}{10\times6} = \frac{-18}{60}$

$\frac{-7}{15} = \frac{-7\times4}{15\times4} = \frac{-28}{60}$

$\frac{-11}{20} = \frac{-11\times3}{20\times3} = \frac{-33}{60}$

and

$\frac{-17}{30} = \frac{-17\times2}{30\times2} = \frac{-34}{60}$

Clearly,

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

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

(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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$\frac{-5}{6} = \frac{-5\times12}{6\times12} = \frac{-60}{72}$

$\frac{-7}{12} = \frac{-7\times6}{12\times6} = \frac{-42}{72}$

$\frac{-13}{18} = \frac{-13\times4}{18\times4} = \frac{-52}{72}$

and

$\frac{-23}{24} = \frac{-23\times3}{24\times3} = \frac{-69}{72}$

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,

$\frac{-10}{11} = \frac{-10\times12}{11\times12} = \frac{-120}{132}$

$\frac{-19}{22} = \frac{-19\times6}{22\times6} = \frac{-114}{132}$

$\frac{-23}{33} = \frac{-23\times4}{33\times4} = \frac{-92}{132}$

and

$\frac{-39}{44} = \frac{-39\times3}{44\times3} = \frac{-117}{132}$

Clearly,

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

Q10

Answer :

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

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

3. False
$0 = \frac{a}{b}$, $\textbf{for } a = 0 \textbf{ and } b \neq 0$. Thus, 0 is a rational and whole number.

********** END **********