Rational Numbers Ex 1.6 Q1

Answer :

We have to verify that $x \times y = y \times x$.

(i) $x = \frac{-1}{3}, y = \frac{2}{7}$

$x \times y = \frac{-1}{3} \times \frac{2}{7} = \frac{-2}{21}$

$y \times x = \frac{2}{7} \times \frac{-1}{3} = \frac{-2}{21}$

$\therefore \frac{-1}{3} \times \frac{2}{7} = \frac{2}{7} \times \frac{-1}{3}$

Hence verified.

(ii) $x = \frac{-3}{5}, y = \frac{-11}{13}$

$\mathrm{x} \times \mathrm{y} = \frac{-3}{5} \times \frac{-11}{13} = \frac{33}{65}$

$y \times x = \frac{-11}{13} \times \frac{-3}{5} = \frac{33}{65}$

$\therefore \frac{-3}{5} \times \frac{-11}{13} = \frac{-11}{13} \times \frac{-3}{5}$

Hence verified.

$\left(\text{iii}\right)\ x = 2,\ y = \frac{7}{-8}$

$x \times y = 2 \times \frac{7}{-8} = \frac{7}{-4}$

$y \times x = \frac{7}{-8} \times 2 = \frac{7}{-4}$

$\therefore\ 2 \times \frac{7}{-8} = \frac{7}{-8} \times 2$

Hence verified.

$\left(\text{iv}\right)\ x = 0,\ y = \frac{-15}{8}$

$x \times y = 0 \times \frac{-15}{8} = 0$

$y \times x = \frac{-15}{8} \times 0 = 0$

$\therefore\ 0 \times \frac{-15}{8} = \frac{-15}{8} \times 0$

Hence verified.

Answer :

We have to verify that $x \times \left(y \times z\right) = \left(x \times y\right) \times z$.

$\left(\text{i}\right)\ x = \frac{-7}{3}, y = \frac{12}{5}, z = \frac{4}{9}$

$\text{x} \times \left(\text{y} \times \text{z}\right) = \frac{-7}{3} \times \left(\frac{12}{5} \times \frac{4}{9}\right) = \frac{-7}{3} \times \frac{16}{15} = \frac{-112}{45}$

$\left(x \times y\right) \times z = \left(\frac{-7}{3} \times \frac{12}{5}\right) \times \frac{4}{9} = \frac{-28}{5} \times \frac{4}{9} = \frac{-112}{45}$

$\therefore \frac{-7}{8} \times \left(\frac{15}{5} \times \frac{4}{9}\right) = \left(\frac{-7}{8} \times \frac{15}{5}\right) \times \frac{4}{9}$

Hence verified.

$\left(\text{ii}\right)\ x = 0, y = \frac{-3}{5}, z = \frac{-9}{4}$

$x \times \left(y \times z\right) = 0 \times \left(\frac{-3}{5} \times \frac{-9}{4}\right) = 0 \times \frac{27}{20} = 0$

$\left(x \times y\right) \times z = \left(0 \times \frac{-3}{5}\right) \times \frac{-9}{4} = 0 \times \frac{-9}{4} = 0$

$\therefore 0 \times \left(\frac{-3}{5} \times \frac{-9}{4}\right) = \left(0 \times \frac{-3}{5}\right) \times \frac{-9}{4}$

$\left(\text{iii}\right)\ x = \frac{1}{2}, y = \frac{5}{-4}, z = \frac{-7}{4}$

$x \times \left(y \times z\right) = \frac{1}{2} \times \left(\frac{5}{-4} \times \frac{-7}{4}\right) = \frac{1}{2} \times \frac{35}{16} = \frac{35}{32}$

$\left(x \times y\right) \times z = \left(\frac{1}{2} \times \frac{5}{-4}\right) \times \frac{-7}{4} = \frac{5}{-8} \times \frac{-7}{4} = \frac{35}{32}$

$\therefore \frac{1}{2} \times \left(\frac{5}{-4} \times \frac{-7}{4}\right) = \left(\frac{1}{2} \times \frac{5}{-4}\right) \times \frac{-7}{4}$

Hence verified.

$\left(\text{iv}\right)\ x = \frac{5}{7}, y = \frac{-12}{13}, z = \frac{-7}{18}$

$x \times \left(y \times z\right) = \frac{5}{7} \times \left(\frac{-12}{13} \times \frac{-7}{18}\right) = \frac{5}{7} \times \frac{14}{39} = \frac{10}{39}$

$\left(x \times y\right) \times z = \frac{5}{7} \times \frac{-12}{13}\right) \times \frac{-7}{18} = \frac{-60}{91} \times \frac{-7}{18} = \frac{10}{39}$

$\therefore \frac{5}{7} \times \left(\frac{-12}{13} \times \frac{-7}{18}\right) = \left(\frac{5}{7} \times \frac{-12}{13}\right) \times \frac{-7}{18}$

Hence verified.

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