Rational Numbers Ex 1.6 Q3

Answer :

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

(i) $x = \frac{-3}{7}$, $y = \frac{12}{13}$, $z = \frac{-5}{6}$

$\mathrm{x} \times \left(\mathrm{y}+\mathrm{z}\right) = \frac{-3}{7} \times \left(\frac{12}{13} + \frac{-5}{6}\right) = \frac{-3}{7} \times \frac{72-65}{78} = \frac{-3}{7} \times \frac{7}{78} = \frac{-1}{26}$

$x \times y + x \times z = \frac{-3}{7} \times \frac{12}{13} + \frac{-3}{7} \times \frac{-5}{6}$

$= \frac{-36}{91} + \frac{5}{14}$

$= \frac{-36\times2+5\times13}{182} = \frac{-72+65}{182}$

$= \frac{-1}{26}$

$\therefore \frac{-3}{7} \times \left(\frac{12}{13} + \frac{-5}{6}\right) = \frac{-3}{7} \times \frac{12}{13} + \frac{-3}{7} \times \frac{-5}{6}$

Hence verified.

(ii) $x = \frac{-12}{5}$, $y = \frac{-15}{4}$, $z = \frac{8}{3}$

$x \times \left(y+z\right) = \frac{-12}{5} \times \left(\frac{-15}{4} + \frac{8}{3}\right) = \frac{-12}{5} \times \frac{-45+32}{12} = \frac{-12}{5} \times \frac{-13}{12} = \frac{13}{5}$

$x \times y + x \times z = \frac{-12}{5} \times \frac{-15}{4} + \frac{-12}{5} \times \frac{8}{3}$

$= \frac{9}{1} + \frac{-32}{5}$

$= \frac{45-32}{5}$

$= \frac{13}{5}$

$\therefore \frac{-12}{5} \times \left(\frac{-15}{4} + \frac{8}{3}\right) = \frac{-12}{5} \times \frac{-15}{4} + \frac{-12}{5} \times \frac{8}{3}$

Hence verified.

(iii) $x = \frac{-8}{3}$, $y = \frac{5}{6}$, $\mathrm{z} = \frac{-13}{12}$

$x \times \left(y+z\right) = \frac{-8}{3} \times \left(\frac{5}{6} + \frac{-13}{12}\right) = \frac{-8}{3} \times \frac{10-13}{12} = \frac{-8}{3} \times \frac{-3}{12} = \frac{2}{3}$

$x \times y + x \times z = \frac{-8}{3} \times \frac{5}{6} + \frac{-8}{3} \times \frac{-13}{12}$

$= \frac{-20}{9} + \frac{26}{9}$

$= \frac{-20+26}{9}$

$= \frac{2}{3}$

$\therefore \frac{-8}{3} \times \left(\frac{5}{6} + \frac{-13}{12}\right) = \frac{-8}{3} \times \frac{5}{6} + \frac{-8}{3} \times \frac{-13}{12}$

Hence verified .

$\left(\text{iv}\right)\ x=\frac{-3}{4}\ ,\ y=\frac{-5}{2}\ ,\ \text{z}=\frac{7}{6}$

$x\times\left(y+z\right)=\frac{-3}{4}\times\left(\frac{-5}{2}+\frac{7}{6}\right)=\frac{-3}{4}\times\frac{-15+7}{6}=\frac{-3}{4}\times\frac{-8}{6}=1$

$x\times y+x\times z=\frac{-3}{4}\times\frac{-5}{2}+\frac{-3}{4}\times\frac{7}{6}$

$=\frac{15}{8}+\frac{-7}{8}$

$=\frac{15-7}{8}$

$=1$

$\therefore\frac{-3}{4}\times\left(\frac{-5}{2}+\frac{7}{6}\right)=\frac{-3}{4}\times\frac{-5}{2}+\frac{-3}{4}\times\frac{7}{6}$

Hence verified.

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