

Properties of a Rational Number

- **Closure-** Rational numbers are closed under addition, subtraction and multiplication. For eg.- If p and q are any two rational numbers, then the sum, difference and product of these rational numbers is also a rational number. This is known as the closure law

- **Commutativity-** Rational numbers are commutative under addition and multiplication. If p and q are two rational numbers, then:
Commutative law under addition says- $p + q = q + p$.
Commutative law under multiplication says $p \times q = q \times p$.

Note- Rational numbers, integers and whole numbers are commutative under addition and multiplication. Rational numbers, integers and whole numbers are non commutative under subtraction and division.

- **Associativity-** Rational numbers are associative under addition and multiplication. If a, b, c are rational numbers, then:
Associative property under addition: $p + (q + r) = (p + q) + r$
Associative property under multiplication: $p(qr) = (pq)r$

- **Role of zero and one-** 0 is the additive identity for rational numbers. 1 is the multiplicative identity for rational numbers.

- **Multiplicative inverse-** If the product of two rational numbers is 1, then they are called multiplicative inverse of each other.

Eg. $4/9 * 9/4 = 1$

Rational Numbers Test

Maximum time- 30 minutes

Maximum marks- 24(2 marks each)

1. Write three rational numbers occurring between $\frac{1}{3}$ and $\frac{4}{5}$.
2. Multiply the negative of $\frac{2}{3}$ by the inverse of $\frac{9}{7}$.
3. What should be added to $-\frac{16}{3}$ to make it $\frac{1}{9}$?
4. What should be subtracted from $\frac{5}{8}$ to make it -1 ?
5. Write different properties of a rational number.
6. Represent $\frac{3}{4}$ and $\frac{8}{9}$ on a number line.
7. Find the greater of the two $-\frac{12}{5}$ and $\frac{4}{9}$
8. Multiply the negative of $\frac{29}{2}$ by its inverse.
9. Write a rational number equivalent to $\frac{9}{10}$ having 90 as numerator.
10. Write a rational number equivalent to $\frac{18}{29}$ having 87 as denominator.
11. Write $\frac{2}{3}$, $-\frac{4}{9}$, $-\frac{8}{11}$ in ascending order.
12. Write $\frac{2}{3}$, $-\frac{4}{9}$, $-\frac{8}{11}$ in descending order.