

RATIONAL NUMBERS PROPERTIES

Definition: A rational number is any number that can be expressed as the quotient p/q of two integers, where $q \neq 0$.

Closure	The sum, difference, and product of two rational numbers is always rational.	$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$
Commutative	Changing the order of operands does not change the result (Addition/Multiplication).	$a + b = b + a$
Associative	Changing the grouping of operands does not change the result.	$(a + b) + c = a + (b + c)$
Distributive	Multiplying a sum by a number is the same as multiplying each addend individually.	$a(b + c) = ab + ac$
Additive Identity	Adding zero to any rational number results in the original number.	$\frac{3}{5} + 0 = \frac{3}{5}$
Multiplicative Identity	Multiplying any rational number by one results in the original number.	$\frac{7}{8} \cdot 1 = \frac{7}{8}$
Additive Inverse	The sum of a number and its negative counterpart is zero.	$\frac{2}{3} + (-\frac{2}{3}) = 0$

Reciprocal

The product of a number and its multiplicative inverse is one.

$$\begin{aligned} (4/5) \cdot (5/4) &= 1 \\ (5/4) &= 1 \end{aligned}$$