RECIPROCAL DISTANCE

For a nonzero real number a, the inverse $\frac{1}{a}$ satisfies $a \cdot \frac{1}{a} = 1$. On the number line, its distance from the origin is the reciprocal of the distance of a.

INVERSE OF A REAL NUMBER

$$a \cdot \frac{1}{a} = 1$$

split by $|a|$ compared with 1

CASE 1

$|a| > 1$

Inverse is closer to 0

E.G. $5 \to \frac{1}{5}$

CASE 2

$0 < |a| < 1$

Inverse is farther from 0

E.G. $\frac{1}{4} \to 4$

CASE 3

$|a| = 1$

Its own inverse

just 1 and -1

CASE 4

$a = 0$

No inverse

no real x satisfies $0 \cdot x = 1$

CARRIES OVER

The exception for zero carries over to complex numbers.