

# Números reales

Docente: Luis Rodrigo Barba Guamán

Componente: Matemática

Correo: lrbarba@utpl.edu.ec

Licencia: 

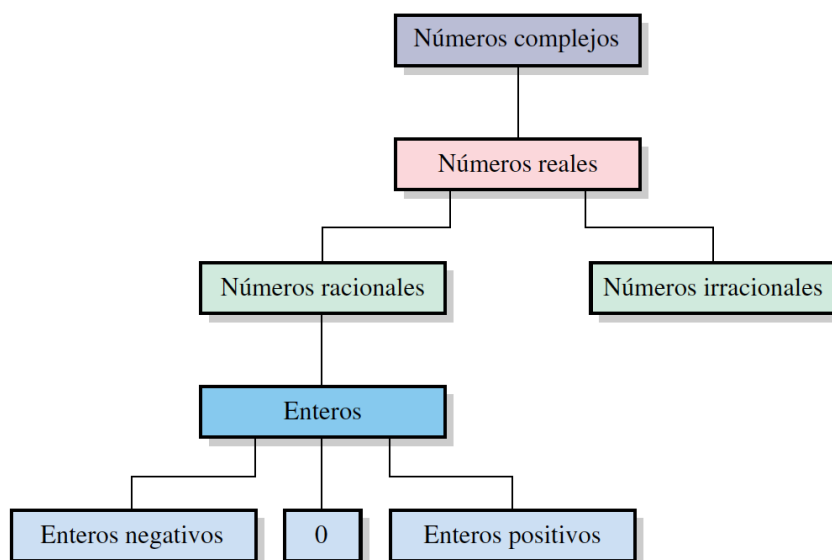


Fig 1. Números empleados en el álgebra (Swokowski, E. 2011) línumero e

## Propiedades

La adición es conmutativa	$a + b = b + a$
La adición es asociativa	$a + (b + c) = (a + b) + c$
0 es la identidad aditiva	$a + 0 = a$
-a es el inverso aditivo, o negativo de a	$a + (-a) = 0$
La multiplicación es conmutativa	$ab = ba$
1 es la identidad multiplicativa	$a \cdot 1 = a$

$\frac{a}{b} = \frac{c}{d}, \text{ si } ad = bc$
$\frac{ad}{bd} = \frac{a}{b}$
$\frac{a}{-b} = \frac{-a}{b} = -\frac{a}{b}$
$\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$
$\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$
$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$
$\frac{a}{b} \div \frac{c}{d} = \frac{ad}{bc}$
$(-a) b = -(ab) = a (-b)$
$(-a) (-b) = ab$
$a^{-1} = \frac{1}{a}, \text{ si } a \neq 0$
Si $a \geq 0$ , entonces $ a  = a$

### Ejemplos

$$-(-3)$$

$$(-2) 3$$

$$2^{-1}$$

$$\left(\frac{3}{4}\right)^{-1}$$

$$\frac{4}{3} + \frac{5}{8}$$

$$\frac{4}{3} \div \frac{5}{8}$$

$$-4 < 0$$

$$\frac{1}{3} > 0.33$$

### La recta numérica

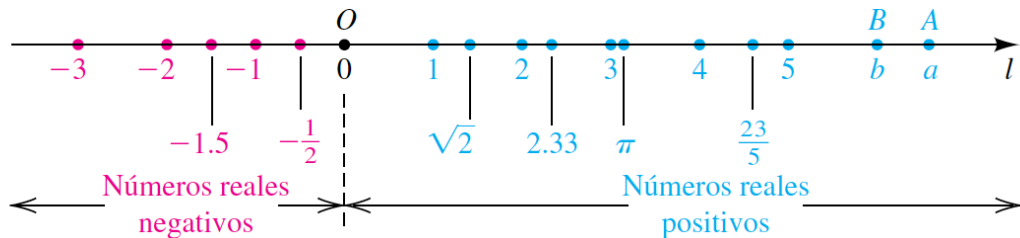


Fig 2. La recta numérica (Swokoswki, E. 2011)  
[número e]

$$\text{Distancia}[x1\_ , x2\_ ] := \sqrt{\left( (x2[[2]] - x1[[2]])^2 \right) + \left( (x2[[1]] - x1[[1]])^2 \right)}$$

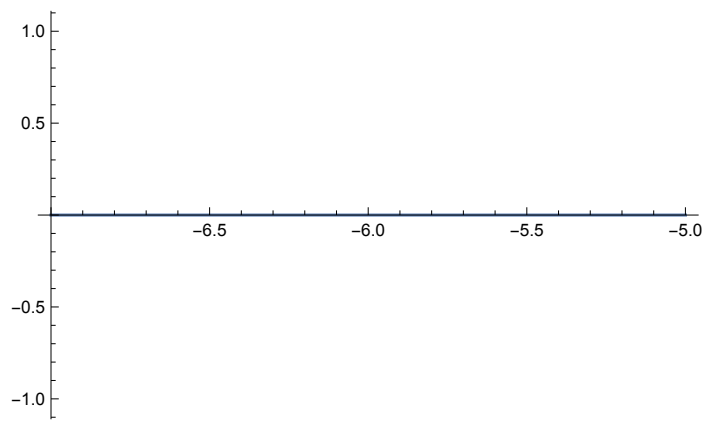
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m[x1_, x2_] := (x2[[2]] - x1[[2]]) / (x2[[1]] - x1[[1]])
recta[x1_, x2_, x_] := m[x1, x2] (x - x1[[1]] + x1[[2]])
x1 = {-3, 0};
x2 = {-5, 0};
Distancia[x1, x2]
l1 = recta[x1, x2, x]
2
0

```

```
Plot[l1, {x, -7, -5}]
```

[representación gráfica]



## Forma científica

$$a = c \times 10^n, \text{ donde } 1 \leq c \leq 10 \text{ y } n \text{ es un entero}$$

## Ejemplos

$$5.13 \times 10^2$$

$$6.48 \times 10^{-4}$$

$$2.07 \times 10^4$$

$$(45\,000\,000\,000)^2$$

## Ejercicios

$$(-2)^8$$

$$(2)^{-6}$$

$$\frac{4}{5} + \left( \frac{78}{33} - \frac{2}{3} \times \frac{5}{3} \right)^2$$

$$\left(\frac{3}{4}\right)^{-1}$$

- $\left[ \left(2 - 1\frac{3}{5}\right)^2 + \left(\frac{5}{8} - \frac{3}{4}\right) - \left(\frac{6}{5} \cdot \frac{1}{3}\right)^4 \cdot \left(7\frac{1}{2}\right)^3 \right] \div \left(5 - \frac{6}{5}\right)$
- $\frac{\left(2 - \frac{1}{5}\right)^2}{\left(3 - \frac{2}{9}\right)^{-1}} \div \frac{\left(\frac{6}{7} \cdot \frac{5}{4} - \frac{2}{7} \div \frac{1}{2}\right)^3}{\left(\frac{1}{2} - \frac{1}{3} \cdot \frac{1}{4} \div \frac{1}{5}\right)}$   $- 5\frac{1}{7}$
- $\frac{2}{3} \div \left[ 5 \div \left(\frac{2}{4} + 1\right) - 3\left(\frac{1}{2} - \frac{1}{4}\right) \right]$
- $\frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left[\left(\frac{3}{2}\right)^4\right]^{-2}}{\left(\frac{3}{2}\right)^{-5} \left(\frac{2}{3}\right)^1 \left[\left(\frac{2}{3}\right)^5\right]^2 \left(\frac{8}{27}\right)^3}$
- $\frac{\frac{1}{2} + \frac{\frac{2}{3}}{\frac{1}{4}} - 2}{\frac{\frac{2}{3} + 1}{\frac{1}{5}}}$

## Referencias

Swokowski, E. W. (2011). Álgebra y trigonometría. Cengage Learning Editores.