

# Jerarquia de Operaciones

①

Parentesis  
Corchetes  
llaves

②

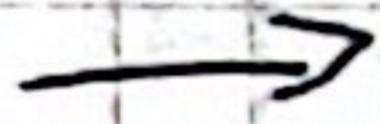
Potencia  
Raices

③

Multiplicacion  
Division

④

Suma  
Resta



$$2+2-3$$

$$\textcircled{2+2}-3$$

$$\textcircled{4-3}$$

1

$$(2+2)-1 \times 5$$

$$4 - 1 \times 5$$

$$4 - 5$$

$$-1$$



$$\textcircled{1} \quad 2 + 7 \times 3 - 6$$

$$2 + 21 - 6$$

$$23 - 6$$

$$17$$

$$\textcircled{2} \quad 5 + (6+2) - 4 \div \sqrt{16}$$

$$5 + 8 - 4 \div \sqrt{16}$$

$$5 + 8 - 4 \div 4$$

$$5 + 8 - 1$$

$$13 - 1$$

$$12$$

$$\textcircled{3} \quad [15 - (2^3 - 10 \div 2)] - 3 + 23 \times 2$$

$$[15 - (8 - 5)] - 3 + 23 \times 2$$

$$[15 - 3] - 3 + 23 \times 2$$

$$12 - 3 + 23 \times 2$$

$$12 - 3 + 46$$

$$9 + 46$$

$$55$$

$$\textcircled{4} \quad \{ 11 \times [3 \times (7 - 6 + 4) + (16 - 9 \div 2)] - 6 \} - 5 \times (2^3 \div 2)$$

$$\{ 11 \times [3 \times 5 + (16 - 2)] - 6 \} - 5 \times (8 \div 2)$$

$$\{ 11 \times [15 + 14] - 6 \} - 5 \times 4$$

$$\{ 11 \times 29 - 6 \} - 5 \times 4$$

$$\{ 319 - 6 \} - 5 \times 4$$

$$313 - 20$$

$$293$$



$$\{ 20 \times (3 - 6^2 \div 8) + 10 \} + [5^3 \times 6 - 15 \div 6] + 9$$

$$\{ 20 \times (3 - 36 \div 8) + 10 \} + [125 \times 6 - 1,5] + 9$$

$$\{ 20 \times (3 - 4,5) + 10 \} + [750 - 2,5] + 9$$

$$\{ 20 \times (-1,5) + 10 \} + 747,5 + 9$$

$$\{ 18,5 + 10 \} + 756,5$$

$$28,5 + 756,5$$

$$785$$

$$\{ 2^3, [(5-3) - (120-4)] + \sqrt{10} \}$$

$$8 \times [2 - 116] + 3,16$$

$$8 \times (-114) + 3,16$$

$$-106 + 3,16$$

$$-102,84$$

$$\{ (13 - 26) - (4 \times 8) \} \times [(26 \div 2 + 3 - 5) + 2]$$

$$\{ -13 - 32 \} \times [(13 + 3 - 5) + 2]$$

$$-45 \times [11 + 2]$$

$$-45 \times 13$$

$$-585$$

2  
256  
5  
195



# Sistema de ecuaciones

## Concepto

\* Es una expresión algebraica

$$2x + 4 = 4$$

$$ax + b = c$$

$$ax + b = 0 \quad ; \quad a \neq 0$$

↗ Incognita  
 ↙ Coeficiente principal  
 ↘ Término independiente

## Propiedad uniforme

$$a + b = c$$

$$a + b + d = c + d$$

## Propiedad cancelativa

$$a + b = c + b$$

$$a = c$$

## Problemas

①  $3x + 20 = 200$

$$3x + 20 - 20 = 200 - 20$$

$$3x = 180$$

$$3x/3 = 180/3$$

$$x = 60$$

11



$$\textcircled{2} \quad 2x + 10 = 20 \quad \left. \begin{array}{l} 2x = 20 - 10 \\ x = \frac{20 - 10}{2} \\ x = 5 \end{array} \right\} \text{verificación}$$

$$2(5) + 10$$

$$10 + 10 = 20$$

$$\textcircled{3} \quad 2 + x = 5 \quad \left. \begin{array}{l} x = 5 - 2 \\ x = 3 \end{array} \right\} 2 + 3 = 5$$

$$\textcircled{4} \quad 5a - 1 = 14 \quad \left. \begin{array}{l} 5a = 14 + 1 \\ a = \frac{14 + 1}{5} \\ a = \frac{15}{5} = 3 \end{array} \right\} 5(3) - 1 = 14$$

$$15 - 1 = 14$$

$$14 = 14$$

$$\textcircled{5} \quad 8x - 21 = 3 \quad \left. \begin{array}{l} 8x = 3 + 21 \\ x = \frac{3 + 21}{8} \\ x = \frac{24}{8} \\ x = 3 \end{array} \right\} 8(3) - 21 = 3$$

$$24 - 21 = 3$$

$$3 = 3$$



$$\textcircled{6} \quad 2x + 7 = 13$$

$$2x = 13 - 7$$

$$x = \frac{13 - 7}{2}$$

$$x = \frac{6}{2}$$

$$x = 3$$

$$2(3) + 7 = 13$$

$$6 + 7 = 13$$

$$13 = 13$$

$$\textcircled{7} \quad 3x + 4 = 16$$

$$3x = 16 - 4$$

$$x = \frac{16 - 4}{3}$$

$$x = \frac{12}{3} = 4$$

$$3(4) + 4 = 16$$

$$12 + 4 = 16$$

$$16 = 16$$

$$\textcircled{8} \quad 2x + 3x = 10$$

$$5x = 10$$

$$x = \frac{10}{5}$$

$$x = 2$$

$$2(2) + 3(2) = 10$$

$$4 + 6 = 10$$

$$10 = 10$$

# Ecuaciones Cuadráticas

D M A

$$ax^2 + bx + c = 0$$

↑ Termino cuadrático      ↓ Termino lineal      ↗ Termino independiente

$$1) 2(3x - 2) = 2$$

$$6x - 4 = 2$$

$$6x = 2 + 4$$

$$6x = 6$$

$$x = \frac{6}{6}$$

$$x = 1$$

$$2) 2x + 2(2x) = 30$$

$$2x + 4x = 30$$

$$6x = 30$$

$$x = \frac{30}{6}$$

$$x = 5$$

$$3) 5x - 9 = 3(x - 2)$$

$$5x - 9 = 3x - 6$$

$$5x - 3x = -6 + 9$$

$$2x = 3$$

$$x = \frac{3}{2}$$

$$4) \frac{x}{2} + \frac{x}{3} + \frac{12}{7} = x$$

$$\begin{array}{r} 2 & 3 & 1 \\ 1 & 3 & | \\ 1 & & \end{array} \quad \frac{2}{3} > 6$$

$$\frac{x}{2} + \frac{x}{3} + \frac{12}{7} = x$$

$$x = 5.2$$

$$x = 10$$

$$\frac{3x + 2x + 72}{6} = x$$

$$3x + 2x + 72 = 6x$$

$$72 = 6x - 3x - 9x$$

$$72 = x$$



# Sistema de ecuaciones lineales 2x2 metodo de sustitución

Ecuación 2

$$x - 2y = 3$$

$$\boxed{x = 3 + 2y}$$

$$x = 3 + 2y \leftarrow$$

$$x = 3 + 2(2)$$

$$x = 3 + 4$$

$$\boxed{x = 7}$$

Ecuación 1

$$2x + 3y = 20$$

↑

$$2(3 + 2y) + 3y = 20$$

$$6 + 4y + 3y = 20$$

$$6 + 7y = 20$$

$$7y = 20 - 6$$

$$7y = 14$$

$$y = \frac{14}{7}$$

$$\boxed{y = 2}$$

Ecuación 1

$$x - 2y = -4$$

$$\boxed{x = -4 + 2y}$$

$$x = -4 + 2(3) \leftarrow$$

$$x = -4 + 6$$

$$\boxed{x = 2}$$

Ecuación 1

$$3x + y = 9$$

$$3(-4 + 2y) + y = 9$$

$$-12 + 6y + y = 9$$

$$6y + y = 9 + 12$$

$$7y = 21$$

$$y = \frac{21}{7}$$

$$\boxed{y = 3}$$



$$\ast \begin{cases} x+6y = 27 \\ 7x - 3y = 9 \end{cases}$$

$$7x - 3y = 9$$

$$x+6y = 27$$

$$7(27 - 6y) - 3y = 9$$

$$7x = 27 - 6y$$

$$189 - 42y - 3y = 9$$

$$x = 27 - 6(4)$$

$$-42y - 3y = 9 - 189$$

$$x = 27 - 24$$

$$-45y = -180$$

$$x = 3$$

$$y = \frac{-180}{-45}$$

$$y = 4$$

$$\ast \begin{cases} 2x + 5y = 5 \\ -3x + 7y = 36 \end{cases}$$

$$-3x + 7y = 36$$

$$2x + 5y = 5$$

$$-3\left(\frac{5-5y}{2}\right) + 7y = 36$$

$$2x = 5 - 5y$$

$$-3\left(\frac{5-5y}{2}\right) \cdot 2 + 7y \cdot 2 = 36 \cdot 2$$

$$x = \frac{5 - 5y}{2}$$

$$-3(5 - 5y) + 14y = 72$$

$$2x + 5y = 5$$

$$-15 + 15y + 14y = 72$$

$$2x + 5(3) = 5$$

$$15y + 14y = 72 + 15$$

$$2x = 5 - 15$$

$$29y = 87$$

$$2x = -10$$

$$y = \frac{87}{29}$$

$$x = \frac{-10}{2}$$

$$y = 3$$

$$x = -5$$



# Ejercicio de jerarquía

$$1) 2(3+4) + \sqrt{36} \cdot 2^2$$

$$1 \cdot 7 + \sqrt{36} \cdot 2^2$$

$$14 + 6 \cdot 4$$

$$14 + 24 = 38$$

$$2) 5/3 \cdot (4+2) + \sqrt{81} - 6$$

$$5/3 \cdot (6) + \sqrt{81} - 6$$

$$5/3 \cdot (6) + 9 - 6$$

$$1,6 \cdot (6) + 9 - 6$$

$$10 + 9 - 6$$

$$19 - 6$$

$$12.999 = 13$$

$$3) 24 \cdot 3^2 + (4+2) - \sqrt{36}$$

$$24 \cdot 3^2 + 6 - \sqrt{36}$$

$$24 \cdot 9 + 6 - 6$$

$$216 + 0$$

$$216$$

$$4) 9 \cdot 5^2 - 18 \div 3 - (12+7) + \sqrt{16}$$

$$9 \cdot 25 - 18 \div 3 - 19 + 4$$

$$225 - 6 - 23$$

$$219 - 23$$

$$196$$

