

DIRECCION GENERAL DE EDUCACION  
TECNOLOGICA INDUSTRIAL

---

CENTRO DE ESTUDIOS TECNOLOGICOS,  
INDUSTRIAL Y DE SERVICIOS No. 5  
“GERTRUDIS BOCANEGRA”

---

**PROGRAMAS DE ESTUDIO**

---

**ALGEBRA**

GUIA DE ESTUDIO PARA EXAMEN EXTRAORDINARIO

---

---

ROSAS AGUILAR MARIA ASUNCION  
LOPEZ BRIGIDO JAIR DE JESUS  
MARTINEZ MARTINEZ RAUL  
MARQUEZ BOHOR MAURO

CICLO SEPTIEMBRE – DICIEMBRE 22

**I.- REDUCE LOS TÉRMINOS EN LAS SIGUIENTES EXPRESIONES**

**ALGEBRAICAS:**

$$8d - 6d =$$

$$R= 2d$$

$$15ab - 9ab =$$

$$R= 6ab$$

$$-25x^2y + 32x^2y =$$

$$R= 7x^2y$$

$$-m^2n + 6m^2n =$$

$$R= 5m^2n$$

$$-8x + 9x - x =$$

$$R= 0$$

$$-x + 19x - 18x =$$

$$R= 0$$

$$12mn - 23mn - 5mn =$$

$$R= -16mn$$

$$-5bx + 9bx - 35bx =$$

$$R= -31bx$$

$$7d - 9b + 6d - 4b =$$

$$R= 13 d - 13 b$$

$$x + b - c - b - c + 2c - x =$$

$$R= 0$$

$$5x - 11y - 9 + 20x - 1 - y =$$

$$R= 25x - 12y - 10$$

$$-6m + 8n + 5 - m - n - 6m - 11 =$$

$$R= -13m + 7n - 6$$

$$-m + b + 2b - 2c + 3m + 2c - 3b =$$

$$R = 2m$$

**II. REDUCE LOS SIGUIENTES TÉRMINOS CON SIGNOS DE AGRUPACIÓN:**

$$\{8X - [5X - (-X + Y) + 7Y] + 2Y\} =$$

$$R = 2X - Y$$

$$-\{X + [2Y + 3 - (X + 5Y - 1) + 4 - 6X] + 3Y - 7\} =$$

$$R = 6X - 1$$

$$-\{5X - Y - [3Y - (Z - 2Y + X) - 4XY] + Z\} =$$

$$R = -6X + 6Y - 2Z - 4XY$$

$$6X - 7Y + 3X - 4Y + 8Y + X =$$

$$R = 10X - 3Y$$

$$5a + 2b + 6c - 3a + b - 2c + 4a - 5b + c =$$

$$R = 6a - 2b + 5c$$

$$3a^2 - 3ab + 5b + 2a^2 + 7ab + 4b - b$$

$$R = 5a^2 + 4ab + 8b$$

$$5x^3y - 6x^2y^2 + 7xy^3 - 2x^3y + x^2y^2 - 3xy^3 + 3x^3y + 4x^2y - 2xy^3$$

$$R = 6x^3y - 5x^2y^2 + 2xy^3 + 4x^2y$$

$$\frac{1}{2}a^2x - \frac{5}{8}b^2y + xy + \frac{3}{2}a^2x + \frac{3}{4}b^2y - \frac{2}{7}xy =$$

$$R = 2a^2 + \frac{1}{8}b^2y + \frac{5}{7}xy$$

$$(7X - 4Y + 2Z) - (11X + 9Y - 5Z) =$$

$$R = -4X - 13Y + 7Z$$

$$15a + 7ac - 8bc + 4 - 2(11a - 6bc + 3ac - 1) =$$

$$R = -7a + ac + 4bc + 6$$

$$\left(\frac{3}{5}XY + \frac{1}{4}XZ - \frac{2}{3}YZ\right) - \left(\frac{1}{5}XY + \frac{3}{4}XZ + \frac{4}{9}YZ\right) =$$

$$R = \frac{2}{5}XY - \frac{1}{2}XZ - \frac{10}{9}YZ$$

### III. MULTIPLICACIONES:

$$(a^2) (-2a) =$$

$$R = -2a^3$$

$$(a^2) (-2ab^2) =$$

$$R = -6a^3b^2$$

$$(3a^2) (-2ab^2) =$$

$$R = -6a^3b^2$$

$$(-4a^2 b) (-2ab^2) =$$

$$R = 8a^3b^3$$

$$(xy)(-2xy) =$$

$$R = -2x^2y^2$$

$$(2xy) (-5xy) =$$

$$R = -10x^2y^2$$

$$(a^2 b) (-2ab^2 c) =$$

$$R = -2a^3b^3c$$

$$ax(x^2 - 2xy + y^2) =$$

$$R = ax^2 - 2ax^2y + axy^2$$

$$(3xy^2) (2x^2y - 7x - 2y + 5) =$$

$$R = 6x^3y^3 - 21x^2y^2 - 6xy^3 + 15xy^2$$

$$(a^2 + 5a + 6) (-2ab^2) =$$

$$R = -2a^3b^2 - 10a^2b^2 - 12ab^2$$

$$(x^2 + 3x + 5) (x - 4) =$$

$$R = x^3 - x^2 - 7x - 20$$

$$(m^2 + n^2) (4x^2 - 3x + 1) =$$

$$R = 4m^2x^2 - 3m^2x + m^2 + 4n^2x^2 - 3n^2x + n^2$$

#### IV. PRODUCTOS NOTABLES.

$$(X + 5)(X + 6) =$$

$$R = X^2 + 11X + 30$$

$$(X - 5)(X + 7) =$$

$$R = X^2 + 2X - 35$$

$$(X + 5)(X + 8) =$$

$$R = X^2 + 13X + 40$$

$$(7 + 5Z)^2 =$$

$$R = 49 + 70Z + 25Z^2$$

$$(5a^2 - 3b^2)^2 =$$

$$R = 25a^4 - 30a^2b^2 + 9b^4$$

$$(m^2 + 3n)^2 =$$

$$R = m^4 + 6m^2n + 9n^2$$

$$(4a - 5x^2)^2 =$$

$$R = 16a^2 - 40ax^2 + 25x^4$$

$$(7X + 5YZ)^2 =$$

$$R = 49X^2 + 70XYZ + 25Y^2Z^2$$

$$(5a^2x - 3b^2y)^2 =$$

$$R = 25a^4x^2 - 30a^2b^2xy + 9b^4y^2$$

$$(m^2 + 3/2n)^2 =$$

$$R = m^4 + \frac{3m^2}{n} + \frac{9}{4n^2}$$

$$(4/3a - 2/5x^2)^2 =$$

$$R = \frac{16}{9}a^2 - \frac{16}{5}ax^2 + \frac{4}{25}x^4$$

$$(X + 5)(X - 5) =$$

$$R = X^2 - 25$$

$$(X + 8)(X - 8) =$$

$$R = X^2 - 64$$

$$(X - 5)(X + 5) =$$

$$R = X^2 - 25$$

$$(7XY + Z^2)(7XY - Z^2) =$$

$$R = 49X^2Y^2 - Z^4$$

$$(9M^2N + 2XY^2)(9M^2N - 2XY^2) =$$

$$R = 81M^4N^2 - 4X^2Y^4$$

**V. REALIZA LAS DIVISIONES:**

$$10X^3 / 5X^2 =$$

$$R = 2X$$

$$35X^4 / 5X^2 =$$

$$R = 7X^2$$

$$45X^5 / 9X^3 =$$

$$R = 5$$

$$12a^5 b^2 / 6 a b^5 =$$

$$R = \frac{12a^4}{b^3}$$

$$9q^2 r^5 / 3q^5 r =$$

$$R = \frac{3r^4}{q^3}$$

$$(10X^3 - 25X^4) / 5X^2 =$$

$$R = -5X^2 + 2X$$

$$(8Z^3 - 12Z^2) / 2Z^2 =$$

$$R = 4Z - 6$$

$$(8Z^3 - 12Z^2 + 4Z) / 4Z^2 =$$

$$R = 2Z - 3 + \frac{1}{Z}$$

$$(8Z^3 - 10Z^2 + 4Z - 12) / 2Z^2$$

$$R = 4Z - 5 + \frac{2}{Z} - \frac{6}{Z^2}$$

$$(10X^3 - 25X^4 + 35X) / 5X^2$$

$$R = -5X^2 + 2X + \frac{7}{X}$$

$$(8Z^3 - 10Z^2 + 4Z - 12) / 2Z^2$$

$$R = 4 - \frac{5}{Z} + \frac{2}{Z^2} - \frac{6}{Z^3}$$

$$(6X^3 - 3X^2 + 7X - 10) / 2X - 3$$

$$R = 3X^2 + 3X + 8$$

$$(4X^3 - 6X^4 - 5X + X^2) / 2X^2 - 6$$

$$R = -3X^2$$

#### VI. RESUELVE LAS SIGUIENTES ECUACIONES LINEALES DE PRIMER GRADO:

1)  $15X - 24 = 3X$

R:  $X=2$

2)  $4X - 5 = 2X - 9$

R:  $X = -2$

3)  $3(X - 5) - 4(X - 6) = 9$

R:  $X=0$

4)  $8X - 3 = 2(X - 3)$

R:  $X = -\frac{1}{2}$

5)  $\frac{5}{3}X + \frac{2}{4}X + \frac{X}{12} = 5$

R:  $X = \frac{20}{9}$

6) 
$$\frac{2X+14}{4} + \frac{X-10}{3} = \frac{X+2}{12}$$

R: X= 0

**VII. RESUELVE LAS SIGUIENTES SISTEMAS DE ECUACIONES LINEALES DE PRIMER GRADO CON DOS INCOGNITAS:**

a) 
$$\begin{array}{l} x + y = 12 \\ \underline{x - y = 4} \end{array}$$

R: X=8, Y=4

b) 
$$\begin{array}{l} 4x - 2y = 9 \\ \underline{3x - 12y = 7} \end{array}$$

R:  $X = \frac{47}{21}, Y = -\frac{1}{42}$

c) 
$$\begin{array}{l} 18x + 5y = -11 \\ \underline{12x + 11y = 31} \end{array}$$

R: X=-2, Y= 5



**VIII. RESUELVE LAS SIGUIENTES ECUACIONES POR FACTOR COMÚN:**

A)  $x^2 + x =$

R:  $x_1 = 0, x_2 = -1$

B)  $6x^2 + 12x =$

R:  $x_1 = 0, x_2 = -2$

C)  $x^2 + x - 6 =$

R:  $x_1 = -3, x_2 = 2$

D)  $6x^2 + 11x + 3 = 0$

R:  $x_1 = -\frac{3}{2}, x_2 = -\frac{1}{3}$

E)  $8x^2 - 2x - 3 = 0$

R:  $x_1 = \frac{3}{4}, x_2 = -\frac{1}{2}$

**IX. RESUELVE LA FACTORIZACIÓN DE PRODUCTOS NOTABLES:**

a.  $x^2 - 5x + 6 =$

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

b.  $x^2 + 15x + 56 =$

R=  $(x+7)(x+8)$

$$c. x^2 - 12x + 36 =$$

$$R = (x-6)(x-6)$$

$$d. x^2 + 24x + 144 =$$

$$R = (x+12)(x+12)$$

$$e. 4x^2 - y^2 =$$

$$R = (2x+y)(2x-y)$$

$$f. 25a^2 - 49 =$$

$$R = (5a+7)(5a-7)$$

**X. RESUELVE LAS SIGUIENTES ECUACIONES DE SEGUNDO GRADO POR**

**FORMULA:**

$$a) \quad 2x^2 - 3x - 2 = 0$$

$$R: x_1 = 2, x_2 = -\frac{1}{2}$$

$$b) \quad 20x^2 + 9x + 1 = 0$$

$$R: x_1 = -\frac{1}{5}, x_2 = -\frac{1}{4}$$

**BIBLIOGRAFÍA.**

**BALDOR, A. ALGEBRA.**

EDITORIAL PATRIA, MÉXICO, 2022.

MATEMÁTICAS I, ed. DGETI

MATEMÁTICAS DE GALDOS, edit. CULTURAL, MÉXICO 2000

MATEMÁTICAS DE FUENLABRADA