Fecha:

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UNIVERSIDAD INTERAMERICANA PARA EL DESARROLLO

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Materia:

23234-LMEI-MTS01-Álgebra Superior

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Trabajo:

Actividad de Aprendizaje 8

UNID

FORMANDO CON VALORES

Sistemas de ecuaciones 3 x 3

1.
$$\begin{cases} 2x + y - z = 1 \quad (2) \\ x - 2y + 2z = 3 \\ 3x - 2y + z = 2 \end{cases}$$

$4x + 2y - 2z = 2$
$x - 2y + 2z = 3$

$5x = 5$
$x = 5/5$
$x = 1$

$2x + y - z = 1$
$3x - 2y + z = 2$
$5x - y = 3$

$5(1) - y = 3$
$-y = 3 - 5$
$y = -3 + 5$
$y = 2$

Resultado
(x, y, z)
(1, 2, 3)

$2(1) + 2 - z = 1$

$2 + 2 - z = 1$

$-z = 1 - 2 - 2$
$-z = -3$
$z = 3$

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

$x + y - z = 1 \cdot (-2) = -2x - 2y + 2z = -2$

2. $2x + 2y - 3z = 1$

$4x - 2y - z = 1$

$-z = -1$

$z = 1$

$2x + 2y - 3z = 1$

$4x - 2y - z = 1$

$6x - 4z = 2$

$4/6 + y + 1 = 1$

$y = 1 - 4/6 + 1$

$y = 4/3 = 1\ 1/3$

$6x - 4 = 2$

$6x = 2 + 4$

$6x = 4$

$x = 4/6$

$4/6 + 4/3 - 1 = 1$

$2 - 1 = 1$

$1 = 1$

[redacted]

Resultado:

(x, y, z)

(4/6, 1 1/3, 1)

3.

$x - y - z = 0$ (2)
$x + 2y - 5z = 2$
$3x - 2y - 4z = 1$

$2x - 2y - 2z = 0$
$x + 2y - 5z = 2$
$3x - 7z = 2$ (4)

$x + 2y - 5z = 2$
$3x - 2y - 4z = 1$
$4x - 9z = 3$ (3)

$3x - 7z = 2$ (4)
$4x - 9z = 3$ (3)

$-12x + 28z = -8$
$12x - 27z = 9$
$z = 1$

$3x - 7(1) = 2$
$3x - 7 = 2$
$3x = 2 + 7$
$3x = 9$
$x = 9/3$
$x = 3$

$3 - y - 1 = 0$
$-y = 0 - 3 + 1$
$-y = -2$
$y = 2$

$3 - 2 - 1 = 0$
$1 - 1 = 0$
$0 = 0$

Resultado

x	y	z
3	2	1

$x + z = y$

4- $2(x+z) = 3y - 1$

$2(y+z) = 3(1-x-z)$

$x - y + z = 0$

$2x - 3y + 2z = -1$

$3x + 2y + 5z = 3$

(5) $= -5x + 5y - 5z = 0$

(2) $= -2x + 2y - 2z = 0$

$-2x + 2y - 2z = 0$

$2x - 3y + 2z = -1$

$-y = -1$

$y = 1$

$-5x + 5y - 5z = 0$

$3x + 2y + 5z = 3$

$-2x + 7y = 3$

$-2x + 7 = 3$

$-2x = 3 - 7$

$-2x = -4$

$-x = -4/2$

$-x = -2$

$x = 2$

$2 - 1 + z = 0$

$1 + z = 0$

$z = 0 - 1$

$z = -1$

$2 - 1 - 1 = 0$

$1 - 1 = 0$

$0 = 0$

Resultado

x	y	z
2	1	-1

obtuso?

$x + 2y = z + 1$

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

$3(x + z) = 4(y + 1)$

$x + 2y - z = 1$ (1)

$3x - 2y - 2z = 0$ (2)

$3x - 4y + 3z = 4$ (3)

$2x + 4y - 2z = 2$ (4)

$3x - 4y + 3z = 4$ (3)

$5x + z = 6$ (5)

$x + 2y - z = 1$ (1)

$3x - 2y - 2z = 0$ (2)

$4x - 3z = 1$ (6)

$5x + z = 6$ (5)

$4x - 3z = 1$ (6)

$-20x - 4z = -24$

$20x - 15z = 6$

$-19z = -19$

$z = \frac{19}{19}$

$z = 1$

$5x + 1 = 6$

$5x = 6 - 1$

$5x = 5$

$x = 5/5$

$x = 1$

$1 + 2y - 1 = 1$

$2y = 1 - 1 + 1$

$2y = 1$

$y = 1/2$

Resultados

(x y z)

(1 1/2 1)

$1 + 2(1/2) - 1 = 1$

$1 + 1 - 1 = 1$

$2 - 1 = 1$

$1 = 1$

$3(x+z) = 1-y$
$6: 2(y-z) = 3-x$
$2(x-y) = z-1$

$3x + y + 3z = 1$ (1)
$x + 2y - 2z = 3$
$2x - 2y - z = -1$

$6x + 2y + 6z = 2$

$x + 2y - 2z = 3$
$2x - 2y - z = -1$
$3x - 3z = 2$ (4)

$6x + 2y + 6z = 2$
$2x - 2y - z = -1$
$8x + 6z = 1$ (5)

$3x - 3z = 2$ (3)
$8x + 6z = 1$ (-3)

$24x - 24z = 16$
$-24x + 15z = -3$
$-39z = 13$
$z = 13/-39$
$z = -1/3$

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

$3(1/3) + y + 3(-1/3) = 2$
$1 + y - 1 = 2$
$y = 2 - 1 + 1$
$y = 2$

$3(1/3) + z + 3(-1/3) = 2$

$1 + 2 - 1 = 2$
$3 - 1 = 2$
$2 = 2$

Resultado
$(x \quad y \quad z)$
$(1/3 \quad 2 \quad -1/3)$

Común denominador

$\frac{x}{4} - \frac{y}{8} - \frac{y}{2} = 1$ 8

$\frac{x}{3} - \frac{y+z}{2} = \frac{8}{3}$

$\frac{x-y}{6} - \frac{z}{3} = \frac{1}{1}$

$2x - y - 4z = 8 \quad (-1)$

$2x - 3y - 3z = 16$

$x - y - 2z = 6 \quad (-3)$

$-2x + y + 4z = -8$
$x - y - 2z = 6$
$-x + 2z = -2$ ④

$2x - 3y - 3z = 16$
$-3x + 3y + 6z = -18$
$-x + 3z = -2$ ⑤

$-x + 2z = -2 \quad (-3)$
$-x + 3z = -2 \quad (2)$

$-2 + 2z = -2$
$2z = -2 + 2$
$2z = 0$
$z = 0/2$
$z = 0$

$2(2) - y + 4(0) = 8$
$4 - y + 0 = 8$
$-y = 8 - 4$
$-y = 4$
$y = -4$

$3x - 6z = 6$
$-2x + 6z = -4$
$x = 2$

$2(2) + 4 - 4(0) = 8$
$4 + 4 = 8$
$8 = 8$

Resultado

x	y	z
2	-4	0

$\frac{x+y+7}{3} - \frac{z}{2} = 0$ (6)

8. $\frac{x-z}{4} + \frac{y}{8} + 1 = 0$

$\frac{z}{2} - \frac{2x+y}{6} - \frac{5}{3} = 0$

$2x + 2y - 3z = -14$

$2x + y - 2z = 8 \quad (-1)$

$2x + y + 3z = 10 \quad (-2)$

$-2x - y + 2z = -8$
$2x + y + 3z = 10$
$5z = 2$
$z = 2/5$

$2x + 2y - 3z = -14$
$-4x - 2y - 6z = -20$
$-2x - 9z = -34$

$2(76/5) + 2y - 3(2/5) = -14$
$152/5 + 2y - 6/5 = -14$
$2y = -14 - 152/5 + 6/5$
$2y = -216/5$
$y = \frac{-216/5}{2}$
$y = -108/5 = 21\frac{3}{5}$

$-2x - 9(2/5) = -34$
$-2x = -34 + 9(2/5)$
$-2x = -34 + 18/5$
$-2x = -15\ 2/5$
$x = \frac{-152/5}{-2}$
$x = 76/5 = 15\ 1/5$

$2(76/5) + 2(-108/5) - 3(2/5) = -14$

$157/5 = 216/5 - 6/5 = -14$
$-64/5 - 6/5 = -14$
$-14 = -14$

Resoltado

$\{(x \quad y \quad z)$
$(15\frac{1}{5} \quad 21\frac{3}{5} \quad 2/5)\}$

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$$\frac{y+6}{2} - \frac{x-z}{3} = 1 \qquad -2x + 3y + 2z = -17$$

$$\frac{y+6}{3} - \frac{x-z}{6} = 1 \qquad -x + 2y + z = -17 \quad (-2)$$

$$\frac{x-2y-5}{3} - \frac{z}{2} = 1 \qquad 2x - 4y - 3z = 11$$

$-2x + 3y + 2z = -17$
$2x - 4y - 3z = 11$
$-y - z = -6$
$17 - z = -6$
$z = -6 - 17$
$-z = -23$
$z = 23$

$-2x + 3y + 2z = -17$
$2x - 4y - 2z = 34$
$-y = 17$
$y = -17$

$-2x + 3(-17) + 2(23) = -17$
$-2x - 51 + 46 = -17$
$-2x = -17 + 51 - 46$
$-2x = -12$
$x = -12/-2$
$x = 6$

Resultado
(x y z)
(6 -17 23)

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Ecuaciones Cuadráticas

1. $6x^2 = 0$

$x^2 = \frac{0}{6}$

$x^2 = 0$

$x = \sqrt{0}$

$x = 0$

2. $x^2 - 25 = 0$

$(x-5)(x+5) = 0$

$x - 5 = 0$ $\quad$ $x + 5 = 0$

$x_1 = 5$ $\quad$ $x_2 = -5$

3. $x^2 + 3x - 10 = 0$

$\frac{-3 \pm \sqrt{9+40}}{2}$

$\frac{-3 \pm \sqrt{49}}{2}$

$\frac{-3 \pm 7}{2}$

$x_1 = \frac{-3+7}{2}$ $\quad$ $x_2 = \frac{-3-7}{2}$

$x_1 = \frac{4}{2}$ $\quad$ $x_2 = \frac{-10}{2}$

$x_1 = 2$ $\quad$ $x_2 = -5$

4. $x^2 - 2x = 0$

$\frac{2 \pm \sqrt{4-0}}{2}$

$\frac{2 \pm \sqrt{4}}{2}$

$\frac{2 \pm 2}{2}$

$x_1 = \frac{2+2}{2}$ $\quad$ $x_2 = \frac{2-2}{2}$

$x_1 = \frac{4}{2}$ $\quad$ $x_2 = \frac{0}{2}$

$x_1 = 2$ $\quad$ $x_2 = 0$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

5. $x^2 + 2x - 24 = 0$

$\frac{-2 \pm \sqrt{4+96}}{2}$

$\frac{-2 \pm \sqrt{100}}{2}$

$\frac{-2 \pm 10}{2}$

$x1 = \frac{-2+10}{2}$

$x1 = \frac{8}{2}$

$x1 = 4$

$x2 = \frac{-2-10}{2}$

$x2 = \frac{-12}{2}$

$x2 = -6$

6. $3x^2 + x - 2 = 0$

$\frac{-1 \pm \sqrt{1+24}}{6}$

$\frac{-1 \pm \sqrt{25}}{6}$

$\frac{-1 \pm 5}{6}$

$x1 = \frac{-1+5}{6}$

$x1 = 4/6$

$x1 = 2/3$

$x2 = \frac{-1-5}{6}$

$x2 = \frac{-6}{6}$

$x2 = -1$

7. $5x^2 + 7x = 0$

$\frac{-7 \pm \sqrt{49-0}}{10}$

$\frac{-7 \pm 7}{10}$

$x1 = \frac{-7+7}{10}$

$x1 = \frac{0}{10}$

$x1 = 0$

$x2 = \frac{-7-7}{10}$

$x2 = \frac{-14}{10} = -7/5$

$x2 = -1\frac{2}{5}$

8. $9x^2 - 1 = 0$

$\frac{1 \pm \sqrt{1-0}}{18}$

$\frac{1 \pm 1}{18}$

$x1 = \frac{1+1}{18}$

$x1 = \frac{2}{18}$

$x1 = 1/9$

$x2 = \frac{1-1}{18}$

$x2 = \frac{0}{18}$

$x2 = 0$