ALGEBRA

Chapter
19,20,21

2th
Session I

RETROALIMENTACION TOMO 7

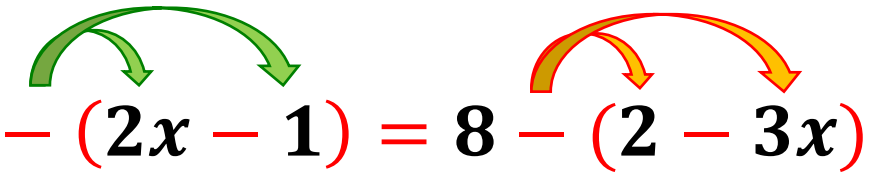
SACO OLIVEROS

PROBLEMA 1:

Resuelve

$$15 - (2x - 1) = 8 - (2 - 3x)$$

Resolución:



$$15 - (2x - 1) = 8 - (2 - 3x)$$

$$15 - 2x + 1 = 8 - 2 + 3x$$

$$16 - 2x = 6 + 3x$$

$$10 = 5x$$

$$x = 2$$

$$C.S = \{2\}$$

PROBLEMA 2:

Calcule el valor de x en la ecuación

$$\frac{x}{2}+\frac{x+1}{7}=x-2$$

Resolución:

$$14\left(\frac{x}{2}\right)+14\left(\frac{x+1}{7}\right)=14(x-2)$$

$$mcm(2;7)=14$$

$$7x+2(x+1)=14x-28$$

$$7x+2x+2=14x-28$$

$$9x+2=14x-28$$

$$30=5x$$

$$x=6$$

$$\boxed{x=6}$$

PROBLEMA 3:

Determine "x" en

$$a^2x - a = b^2x - b$$

Resolución:

$$a^2x - a = b^2x - b$$

$$a^2x - b^2x = -b + a$$

$$x\,(a^2 - b^2) = a - b$$

$$x(a + b)(a - b) = a - b$$

(1)

$$x = \frac{1}{a+b}$$

RECUERDA

DIFERENCIA DE CUADRADOS

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

$$\therefore \quad x = \frac{1}{a+b}$$

PROBLEMA 4:

Calcule las raíces de la ecuación

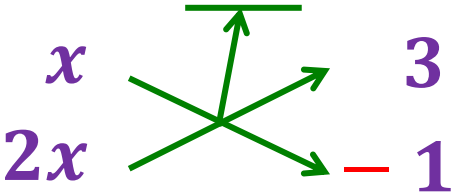
$$3x^2 + 2x + 1 = x^2 - 3x + 4$$

Resolución

$$3x^2 + 2x + 1 = x^2 - 3x + 4$$

$$3x^2 + 2x + 1 - x^2 + 3x - 4 = 0$$

$$2x^2 + 5x - 3 = 0$$



$$x = -3 \quad x = \frac{1}{2}$$

$$(x + 3)(2x - 1) = 0$$

$$x + 3 = 0 \quad \vee \quad 2x - 1 = 0$$

$$\therefore x_1 = -3 \quad \vee \quad x_2 = \frac{1}{2}$$

PROBLEMA 5:

Calcule la mayor raíz de

$$2x^2 - 3x = (x+3)^2 - 13$$

Resolución

$$2x^2 - 3x = (x+3)^2 - 13$$

$$2x^2 - 3x = x^2 + 6x + 9 - 13$$

$$x^2 - 9x + 4 = 0$$

$$a = 1 \; ; \; b = -9 \; ; \; c = 4$$

$$\Delta = b^2 - 4ac$$

$$\Delta = (-9)^2 - 4(1)(4)$$

$$\Delta = 81 - 16$$

$$\Delta = 65$$

Fórmula general:

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$x = \frac{-(-9) \pm \sqrt{65}}{2(1)} = \frac{9 \pm \sqrt{65}}{2}$$

$$x_1 = \frac{9 - \sqrt{65}}{2} \qquad x_2 = \frac{9 + \sqrt{65}}{2}$$

$$\therefore \quad x_2 = \frac{9 + \sqrt{65}}{2}$$

PROBLEMA 6:

Resuelva

$$25x^2 = 1$$

Resolución

$$25x^2 = 1$$

$$25x^2 - 1 = 0$$

$$(5x+1)(5x-1) = 0$$

$$5x + 1 = 0 \quad \vee \quad 5x - 1 = 0$$

$$x = -\frac{1}{5} \qquad x = \frac{1}{5}$$

$$\therefore C.S = \left\{-\frac{1}{5}; \frac{1}{5}\right\}$$

RECUERDA

DIFERENCIA DE CUADRADOS

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

PROBLEMA 7:

Si $x \in [11; 21\rangle$, indique el intervalo de $\frac{x-1}{5}$, sabiendo que su mínimo valor entero representa la sétima parte de la edad de Diego. ¿Cuál es esa edad?

Resolución

$$11 \leq x < 21$$

-1

$$10 \leq x - 1 < 20$$

$\div 5$

$$2 \leq \frac{x-1}{5} < 4$$

Mínimo valor entero $= 2$

$\therefore$ *Diego tiene 14 años.*

PROBLEMA 8

Sabiendo que $x \in [3; 7\rangle$, halle el intervalo que pertenece $\frac{5x-1}{2}$

Resolución

$$3 \leq x < 7$$

$\times 5$

$$15 \leq 5x < 35$$

-1

$$14 \leq 5x - 1 < 34$$

$\div 2$

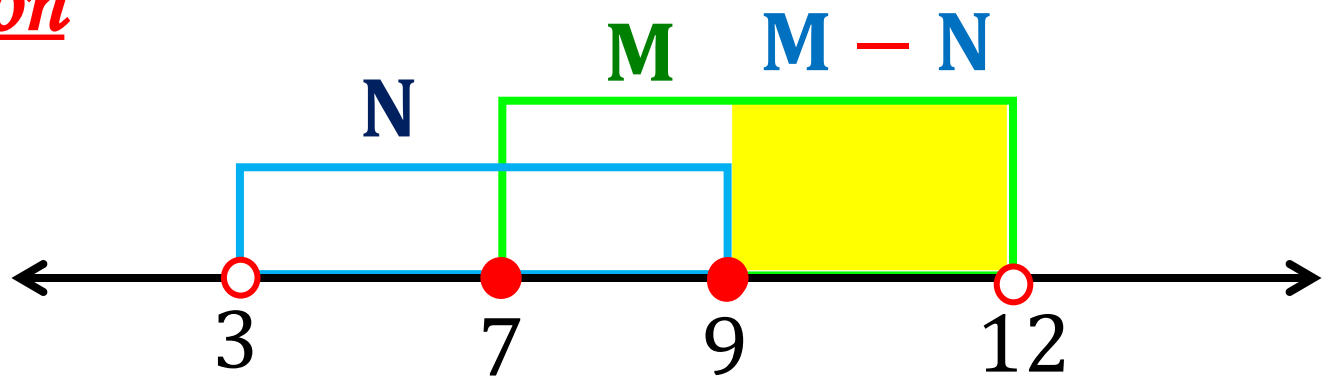
$$7 \leq \frac{5x-1}{2} < 17$$

$$\therefore \frac{5x-1}{2} \in [7; 17\rangle$$

PROBLEMA 9

Si $N = \langle 3; 9\rangle$ y $M = [7; 12\rangle$, halle el intervalo $M - N$ e indique la suma de elementos enteros

Resolución



$$M - N = [9; 12\rangle$$

$$\sum \text{elementos enteros} = 9 + 10 + 11 = 30$$

$$\therefore \sum = 30$$

PROBLEMA 10

Si $x \in [-1; 5\rangle$, halle el intervalo al cual pertenece $-2x + 7$

Resolución

$$-1 \leq x < 5$$

$\times (-2)$

$$-10 < -2x \leq 2$$

$+7$

$$-3 < -2x + 7 \leq 9$$

$$\therefore \quad -2x + 7 \in \langle -3; 9]$$