

“Año de la universalización de la salud”

Universidad Nacional San Agustín

Grupo 3



Participantes:

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Ejercicios

1.-) Resolver

$$a. 4x^2 - 20x + 17 = 0$$

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

Donde

$$a = 4, b = -20, c = 17$$

$$x = \frac{20 \pm \sqrt{400 - 4(4)(17)}}{8}$$

$$x = \frac{5}{2} \pm \sqrt{2}$$

$$b. 3x^2 - 6x = 5$$

$$3x^2 - 6x - 5 = 0$$

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

$$x = \frac{6 \pm \sqrt{36 - 4(3)(-5)}}{6}$$

$$x = 1 \pm \frac{2\sqrt{6}}{3}$$

$$c. x^2 + x + 1 = 0$$

$\Delta < 0 \rightarrow$ resultado imaginario

$$x = \frac{-1 \pm \sqrt{1 - 4 \cdot 1(1)}}{2}$$

$$x = \frac{-1}{2} \pm \sqrt{3}i$$

$$d. 2x^2 - 3x - 5 = -3$$

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

$$\begin{array}{r} 2x^2 - 3x - 2 = 0 \\ 2x^2 \quad \quad \quad 1 = x \\ x \quad \quad \quad -2 = -4x \\ \hline \quad \quad \quad -3x \end{array}$$

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

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

$$e. x^2 - x = 20$$

1° forma

$$x^2 - x - 20 = 0$$

$$x^2 \quad \quad -5 = -5x$$

$$\begin{array}{r} x^2 \quad \quad -5 = -5x \\ x \quad \quad \quad +4 = +4x \\ \hline \quad \quad \quad -x \end{array}$$

$$(x - 5)(x + 4) = 0$$

$$x = 5 \quad \wedge \quad x = -4$$

2° forma

$$x^2 - x = 20$$

$$\left\{ \begin{array}{l} x(x - 1) = 5(4) \\ x = 5 \end{array} \right.$$

$$\left\{ \begin{array}{l} x(x - 1) = -4(-5) \\ x = -4 \end{array} \right.$$

2.1) Resolver

$$a.) \frac{x^2 - 3x + 2}{x - 3} \geq 0$$

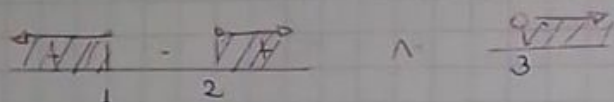
$$a \Rightarrow (x - 2)(x - 1) \geq 0$$

$$b \Rightarrow (x - 3)$$

$$\frac{a}{b} \geq 0$$

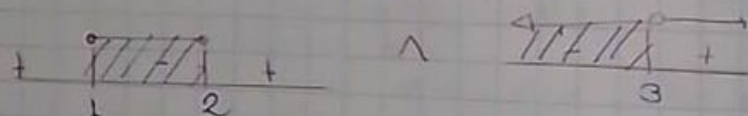
$$\left[\underbrace{(a \geq 0 \wedge b > 0)}_{1^\circ} \vee \underbrace{(a \leq 0 \wedge b < 0)}_{2^\circ} \right]$$

$$1^\circ (x - 2)(x - 1) \geq 0 \wedge x - 3 > 0$$



$$< 3, +\infty)$$

$$2^\circ (x - 2)(x - 1) \leq 0 \wedge (x - 3) < 0$$



$$[1, 2]$$

$$1^\circ \vee 2^\circ = 1^\circ \cup 2^\circ = [+ , 2] \cup]3, +\infty)$$

$$b. \frac{3}{x-1} < \frac{2}{x}$$

$$\frac{3}{x-5} - \frac{2}{x} < 0$$

$$\frac{x+2}{(x-1)(x)} < 0$$

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

$$\frac{p}{b} < 0$$



$$[(a > 0 \wedge b < 0) \vee (a < 0 \wedge b > 0)]$$

$$\int_0^1 (x+2) > 0 \wedge (x-1)x < 0$$

-2

$\langle 0, 1 \rangle$

$$2^{\circ} \quad (x+2) < 0 \quad \wedge \quad (x-1) \quad x > 0$$

$$\langle -8, -2 \rangle$$

$$J^0 \vee 2^0 = J^0 \cup 2^0 =]-\infty, -2] \cup]0, 1[$$

c. $\frac{x}{x+4} \leq \frac{1}{x+1}$

$$\frac{y}{x+4} - \frac{1}{x+1} \leq 0$$

$$a = (x+2)(x-2)$$

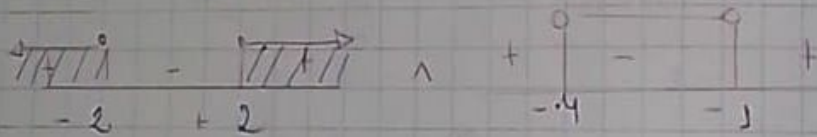
$$b = (x+4)(x+1)$$

$$\frac{(x+2)(x-2)}{(x+4)(x+1)} \leq 0$$

0 7 5

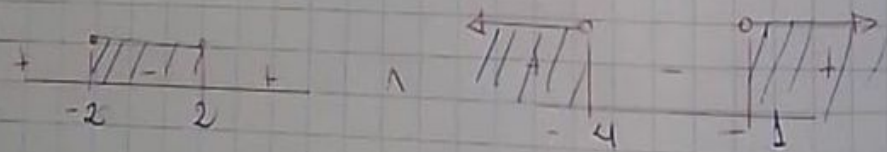
$$[(a \geq 0 \wedge b < 0) \vee (a \leq 0 \wedge b > 0)]$$

$$1^{\circ} (x+2)(x-2) \geq 0 \quad \wedge \quad (x+4)(x+1) < 0$$



$$(-4, -2]$$

$$2^{\circ} (x+2)(x-2) \leq 0 \quad \wedge \quad (x+4)(x-1) > 0$$



$$[-1, 2]$$

$$I^{\circ} \vee 2^{\circ} = I^{\circ} \cup 2^{\circ} = \langle -4, -2 \rangle \cup \langle -1, 2 \rangle$$

$$d. \frac{x^2 - 4x + 4}{x + 4} < 0$$

$$\frac{(x-2)^2}{(x+4)} < 0$$

$$\frac{a}{b} < 0$$

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

$$b = (x+4)$$

$$[\underbrace{(a > 0 \wedge b < 0)}_{1^\circ} \vee \underbrace{(a < 0 \wedge b > 0)}_{2^\circ}]$$

$$1^\circ (x-2)^2 > 0 \quad \wedge \quad x+4 < 0$$

$$\mathbb{R} - \{2\} \quad \wedge \quad \frac{\text{|||||}0}{-4}$$

$$< -\infty, -4 >$$

$$2^\circ (x-2)^2 < 0 \quad \wedge \quad (x+4) > 0$$

$$\emptyset \quad \wedge \quad \frac{\text{|||||}0}{-4}$$

$$\emptyset$$

$$1^\circ \vee 2^\circ = 1^\circ \cup 2^\circ = < -\infty, -4 >$$

$$c \quad \frac{x+7}{x-3} > 0$$

$$\frac{a}{b} > 0$$

$$\begin{aligned} a &= x+7 \\ b &= x-3 \end{aligned}$$

$$[(a > 0 \wedge b > 0) \vee (a < 0 \wedge b < 0)]$$

$\underbrace{\hspace{10em}}_{1^\circ} \qquad \underbrace{\hspace{10em}}_{2^\circ}$

$$1^\circ (x+7) > 0 \quad \wedge \quad x-3 > 0$$

$$x > -7 \quad \wedge \quad x > 3$$

$$\langle 3, +\infty \rangle$$

$$2^\circ (x+7) < 0 \quad \wedge \quad x-3 < 0$$

$$x < -7 \quad \wedge \quad x < 3$$

$$\langle -\infty, -7 \rangle$$

$$1^\circ \vee 2^\circ = 1^\circ \cup 2^\circ = \langle -\infty, -7 \rangle \cup \langle 3, +\infty \rangle$$

$$b) -x^2 + 3x - 2 > 0$$

$$0 > x^2 - 3x + 2$$

$$x \quad -2$$

$$x \quad -1$$

$$0 > (x-2)(x-1)$$



$$C.S.: <1, 2>$$

$$c) x^2 + 8x + 16 \leq 0$$

$$x \quad +4$$

$$x \quad +4$$

$$(x+4)(x+4) \leq 0$$

$$(x+4)^2 \leq 0$$



$$C.S.: \{-4\}$$

$$d) 2x^2 + 5x + 4 < 0$$

$$\Delta = 25 - 4(4)(2)$$

$$\Delta = -7$$

$$C.S.: \text{No tiene soluciones reales} \Rightarrow \{\emptyset\}$$

$$e) 4x^2 + 2x - 5 > 0$$

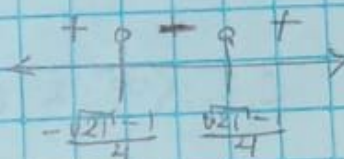
$$x = \frac{-2 \pm \sqrt{4 - 4(-5)(4)}}{8}$$

$$x = \frac{-2 \pm \sqrt{84}}{8}$$

$$x = \frac{-2 \pm 2\sqrt{21}}{8}$$

$$x_1 = \frac{\sqrt{21} - 1}{4}$$

$$x_2 = \frac{-\sqrt{21} - 1}{4}$$

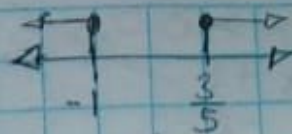


$$C.S.: < \frac{-\sqrt{21}-1}{4}, \frac{\sqrt{21}-1}{4} > \cup$$

$$\left(\frac{\sqrt{21}-1}{4}, \infty \right)$$

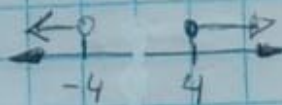
$$f) -5x^2 - 2x + 3 \leq 0$$

$$\begin{array}{r} -5x^2 \\ +3 \\ x \quad +1 \end{array}$$



$$(3 - 5x)(x + 1) \leq 0 \quad \text{C.S.: } \langle \infty; -1 \rangle \cup [3/5; \infty^+]$$

$$g) \frac{x-2}{x+4} \geq \frac{2}{x+4}$$



$$x \neq -4$$

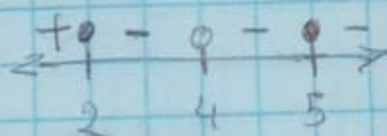
$$\text{C.S.: } \langle \infty; -4 \rangle \cup [4; \infty^+]$$

$$x \geq 4 \quad (x-2)(x+4) \geq 2(x+4)$$

$$(x-4)(x+4) \geq 0$$

$$x^2 - 16 \geq 0$$

$$h) \frac{(2-x)^3 (x-5)^{12}}{(x-4)^2} \geq 0$$



$$2-x=0$$

$$x=2$$

$$x-5=0$$

$$x=5$$

$$x \neq 4$$

$$\text{C.S.: } \langle \infty; 2 \rangle \cup \{5\}$$

$$i) \frac{(x-2)^{\textcircled{4} \text{ PAR}} (x+1)^{\textcircled{6} \text{ PAR}}}{(x-8)^{\textcircled{12} \text{ PAR}}} < 0$$

$$\text{impossible } < 0$$

$$x \neq 8$$

$$\text{C.S.: } \{\emptyset\}$$

4) • $x(x+1) = 6$

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

$$x \quad 3$$

$$x \quad -2$$

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

$$x = -3$$

$$x = 2$$

Esta mal

5) • $x^2 = 2x$

$$x^2 - 2x = 0$$

$$x(x-2) = 0$$

$$x = 0$$

$$x = 2$$

Esta mal