ÉLITE CLASS VIRTUAL

INECUACIONES I

→ DESIGUALDAD:

$>$; $<$; $\geq$; $\leq$

→ CONJUNTO SOLUCIÓN:

→ INTERVALO (PORCIÓN RECTA)

0;0

1:- I. ABIERTO: $\langle -1; 3 \rangle$ ($>$; $<$) INFINITO

2:- I. CERRADO: $[-5; 7]$ ($\geq$; $\leq$)

• PROPIEDADES y OPERACIONES

1:- $a < b \wedge b < c \Rightarrow a < c \wedge a < b < c$

2:- $a^2 \geq 0 \Rightarrow a \in \mathbb{R}$

3:- $a^2 < 0 \Rightarrow a \in \phi$

4:- $a < b \wedge c < 0$

$\Rightarrow -b < -a \; ; \; bc < ac$

5:- $a < b \Rightarrow \frac{1}{b} < \frac{1}{a}$

6:- $a < x < b$

$\Rightarrow -b < -x < -a$

7:- $a < x < b$

$\Rightarrow \frac{1}{b} < \frac{1}{x} < \frac{1}{a}$

8:- $a < x < b$

$a^2 < x^2 < b^2$

9:- $-a < x < b$

$0 \leq x^2 < \text{MAYOR}^2$

10:- $-a < x < -b$

$b^2 < x^2 < a^2$

→ RESOLUCIÓN DE U... INECUACIÓN

1:- VA...

① I. POLINOMIO:

$x^2 - x < 2$

$x^2 - x - 2 < 0$

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

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

$x=2 \quad x=-1$

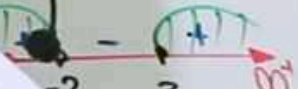
C.S.: $\langle -1; ...$

...RACCIÓN: (DEN $\neq 0$)

...$\frac{-3}{x+2} \geq 0$; $x+2 \neq 0$; $x \neq -2$

...$=0$; $x+2=0$

$x=3 \quad x=-2$



... $\langle -\infty, -2 \rangle \cup [3; \infty \rangle$

ÉLITE CLASS VIRTUAL

INECUACIONES I

→ DESIGUALDAD

$>; <; \geq;$

→ CONJUNTO

→ INTERV

(PORCIÓN REC

0;0 1.- I. AR

• PROPIEDADES y OPERACIONES

1.- $a<b \wedge b<c \Rightarrow a<c \wedge a<b<c$

2.- $a^2 \geq 0 \Rightarrow a \in \mathbb{R}$

3.- $a^2<0 \Rightarrow a \in \phi$

4.- $a<b \wedge c<0$

$\Rightarrow -b<-a \; ; \; bc<ac$

5.- $a<b \Rightarrow \frac{1}{b}<\frac{1}{a}$

$a<x<b$

$-x<-a$

b

$<\frac{1}{a}$

8.- $a<x<b$

$a^2<x^2<b^2$

9.- $-a<x<b$

$0 \leq x^2 <$ MAYOR^2

10.- $-a<x<-b$

$b^2<x^2<a^2$

→ RESOLUCIÓN DE UNA INECUACIÓN

1.- VARIABLES EN UN LADO DE LA INECUACIÓN (+)

2.- FACTORIZAMOS

3.- PUNTOS CRITICOS EN LA RECTA REAL

① I. POLINOMIO:

$x^2-x<2$

$x^2-x-2<0$

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

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

$x=2 \quad x=-1$

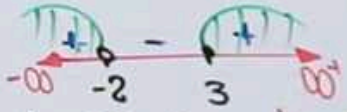
C.S: $\langle -1; 2 \rangle$

② I. FRACCIÓN: (DEN $\neq 0$)

$\frac{x-3}{x+2} \geq 0 \; ; \; x+2 \neq 0; x \neq -2$

$x-3=0 \; ; \; x+2=0$

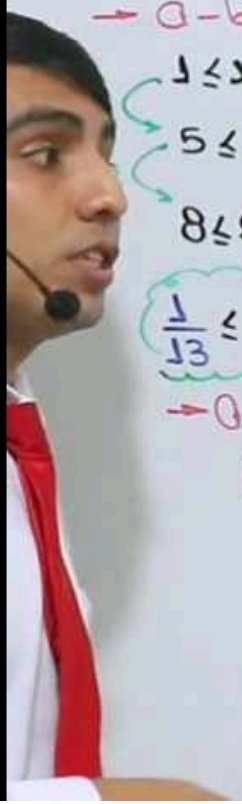
$x=3 \quad x=-2$



C.S: $\langle -\infty, -2 \rangle \cup [3; \infty\rangle$

algebra_semana_15_parte_1 (720p)

ELITE CLASS



① $x \in [1;2] \Rightarrow \frac{1}{a} \leq \frac{1}{5x+3} \leq \frac{1}{b}$

→ "a-b"

$1 \leq x \leq 2$

$5 \leq 5x \leq 10$

$8 \leq 5x+3 \leq 13$

$\frac{1}{13} \leq \frac{1}{5x+3} \leq \frac{1}{8}$

→ $a=13 ; b=8$

$a-b=5$

② $x \in [-1;3\rangle$; $\frac{3x+4}{x+2}$

$3 - \frac{2}{x+2}$

$-1 \leq x < 3$ (+2)

$1 \leq x+2 < 5$

$\frac{1}{5} < \frac{1}{x+2} \leq 1$ (×2)

$\frac{2}{5} < \frac{2}{x+2} \leq 2$

$-2 \leq -\frac{2}{x+2} < -\frac{2}{5}$ (+3)

$1 \leq 3 - \frac{2}{x+2} < \frac{13}{5}$

→ $[1; \frac{13}{5}\rangle$

③ $3 \leq x \leq 7$; $M = \frac{2x+1}{2x-5}$

$1 + \frac{6}{2x-5}$

$3 \leq x \leq 7$ (×2)

$6 \leq 2x \leq 14$ (−5)

$1 \leq 2x-5 \leq 9$

$\frac{1}{9} \leq \frac{1}{2x-5} \leq 1$ (×6)

$\frac{6}{9} \leq \frac{6}{2x-5} \leq 6$ (+1)

$\frac{15}{9} < 1 + \frac{6}{2x-5} \leq 7$

→ $[\frac{5}{3}; 7]$

④ ¿CUÁNTOS ENTEROS?

$3x^2 \leq x+2$

$3x^2 - x - 2 \leq 0$

$3x \cdot 2 = 2x$

$x \cdot (-1) = -3x$

$-x$

$(3x+2)(x-1) \leq 0$

$-\frac{2}{3}$; 1

$+ \; [\; - \;] \; +$

$-2/3$; 1

2

0; 1

→ C.S. = $[-\frac{2}{3}; 1]$

⑤ $x^2 + 4x + 3 < 0$

$x^2 + 4x + 3 < 0$

$x \cdot 3 = 3x$

$x \cdot 1 = x$

$4x$

$(x+3)(x+1) < 0$

-3 ; -1

$+ \; (\; - \;) \; +$

-3 ; -1

→ C.S. = $\langle -3; -1 \rangle$

algebra_semana_15_parte_2 (720p)

ELITE CLASS VIRTUAL

⑥ $x^5-2x^4+2x^3-4x^2-3x+6<0$

	1	-2	2	-4	-3	6
1	↓	1	-1	1	-3	-6
	1	-1	1	-3	-6	0
-1	↓	-1	2	-3	6	
	1	-2	3	-6	0	
2	↓	2	0	6		
→	$1x^2$	0	3	0		

$\Delta<0$

$(x-1)(x+1)(x-2)(x^2+3)<0$

$x=1 \quad x=-1 \quad x=2$

$\langle -\infty; -1\rangle \cup \langle 1; 2\rangle$

2

⑦ $(m+3)x^2-2mx+4=0$

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

$\Delta>0 \rightarrow \mathbb{R}\neq$

$\Delta=0 \rightarrow \mathbb{R}=$

$\Delta<0 \rightarrow$ IMAGINARIOS

$\Rightarrow \Delta \geq 0$

$(-2m)^2-4(m+3)(4)\geq 0$

$4m^2-16m-48\geq 0$

$m^2-4m-12\geq 0$

$m \quad -6 = -6m$

$m \quad 2 = 2m$

$-4m$

$(m-6)(m+2)\geq 0$

$6 \quad -2$

$\rightarrow C.S: \langle -\infty; -2]\cup[6; \infty\rangle$

⑧ $(x-4)(2-x)(x+1)\geq 0$

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

$4 \quad 2 \quad -1$

$\infty^- \quad -1 \quad 2 \quad 4 \quad \infty^+$

C.S: $\langle -\infty; -1]\cup[2; 4]$

4

⑨ $\left(\frac{6x-3}{2}-(2x-6)\right)>\frac{x}{4}$

$2(6x-3)-4(2x-6)>x$

$12x-6-8x+24$

⑩ $x\in\langle -2; 3\rangle$; $0\leq x^2+2x+3$

(x^2+2x+1)

$(x+1)^2$

$a+b=??$

$-2<x<3$

$+1$

$-1<x+1<4$

$0\leq(x+1)^2<16$

$\leq(x+1)^2+2<18$

$a=2;\ b=18$

$a+b=20$

algebra_semana_15_parte_2 (720p)

ÉLITE CLASS VIRTUAL

⑥ $1x^5-2x^4+2x^3-4x^2-3x+6<0$

	1	-2			6
1	↓				-6
	1				0
-1	↓				
	1				
2	↓	2			
→	$1x^2$	0			

→ $(x-$ $+3)<0$

⑦ $(m+3)x^2-2mx+4=0$

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

$\Delta>0 \rightarrow \mathbb{R}\neq$

$\Delta=0 \rightarrow \mathbb{R}=$

$\Delta<0 \rightarrow$ IMAGINARIOS

$\Rightarrow \Delta \geq 0$

$(-2m)^2-4(m+3)(4)\geq 0$

$4m^2-16m-48\geq 0$

$m^2-4m-12\geq 0$

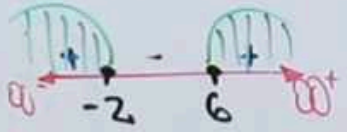
m −6 → −6m

m 2 → 2m

−4m

$(m-6)(m+2)\geq 0$

6 −2

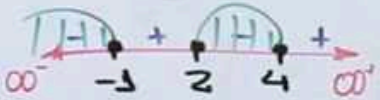


→ C.S: $\langle -\infty,-2]\cup[6;\infty\rangle$

⑧ $(x-4)(2-x)(x+1)\geq 0$

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

4 2 −1



C.S: $\langle -\infty,-1]\cup[2,4]$

4

⑨ $\left(\frac{6x-3}{2}-(2x-6)>\frac{x-3}{4}\right)\times 4$

$2(6x-3)-4(2x-6)>x-3$

$12x-6-8x+24>x-3$

$3x>-21$

$x>-7$

$\langle -7;\infty\rangle$

⑩ $x\in\langle -2;3\rangle$; $a\leq x^2+2x+3<$

$(x^2+2x+1)+$

$(x+1)^2+2$

$a+b=??$

+1 ($-2<x<3$

$-1<x+1<4$

( )² ($0\leq(x+1)^2<16$

+2 ($2\leq(x+1)^2+2<18$

$a=2;\ b=18$

$a+b=20$

ÉLITE CLASS VIRTUAL

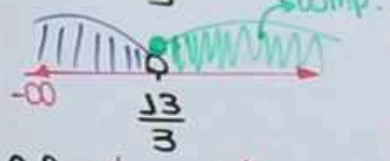
(11) $\frac{4x+1}{5} > \frac{3x-2}{3}$

$3(4x+1) > 5(3x-2)$

$12x+3 > 15x-10$

$13 > 3x$

$\frac{13}{3} > x$



C.S: $\langle -\infty; \frac{13}{3} \rangle$

COMPLEMENTO:

$\left[\frac{13}{3}; \infty\right\rangle$

(12) $\underbrace{2x^2 - 2mx - n}_{x \in \langle -3;5 \rangle} < 0$

$(x+3)(x-5) < 0$

$x^2 - 2x - 15 < 0$ ×2

$2x^2 - 4x - 30 < 0$

$-2mx = -4x$

$2m = 4$

$m = 2$

$-n = -30$

$n = 30$

$\Rightarrow m \cdot n = 60$

(13) $\frac{2}{3} < \frac{x+1}{x+3} < \frac{7}{9}$

$\frac{2}{3} < 1 - \frac{2}{x+3} < \frac{7}{9}$ −1

$-\frac{1}{3} < -\frac{2}{x+3} < -\frac{2}{9}$

$\frac{2}{9} < \frac{2}{x+3} < \frac{1}{3}$ ÷2

$\frac{1}{9} < \frac{1}{x+3} < \frac{1}{6}$

$6 < x+3 < 9$ −3

$3 < x < 6$

C.S: $\langle 3; 6 \rangle$

(15) $\left(\frac{x}{4} + 1 < \frac{x-5}{2} < \frac{x}{3} + 2\right)$ ×12

→ m.c.m (4; 2; 3) = 12

$3x + 12 < 6x - 30 < 4x + 24$

$3x + 12 < 6x - 30$

$42 < 3x$

$14 < x$

$6x - 30 < 4x + 24$

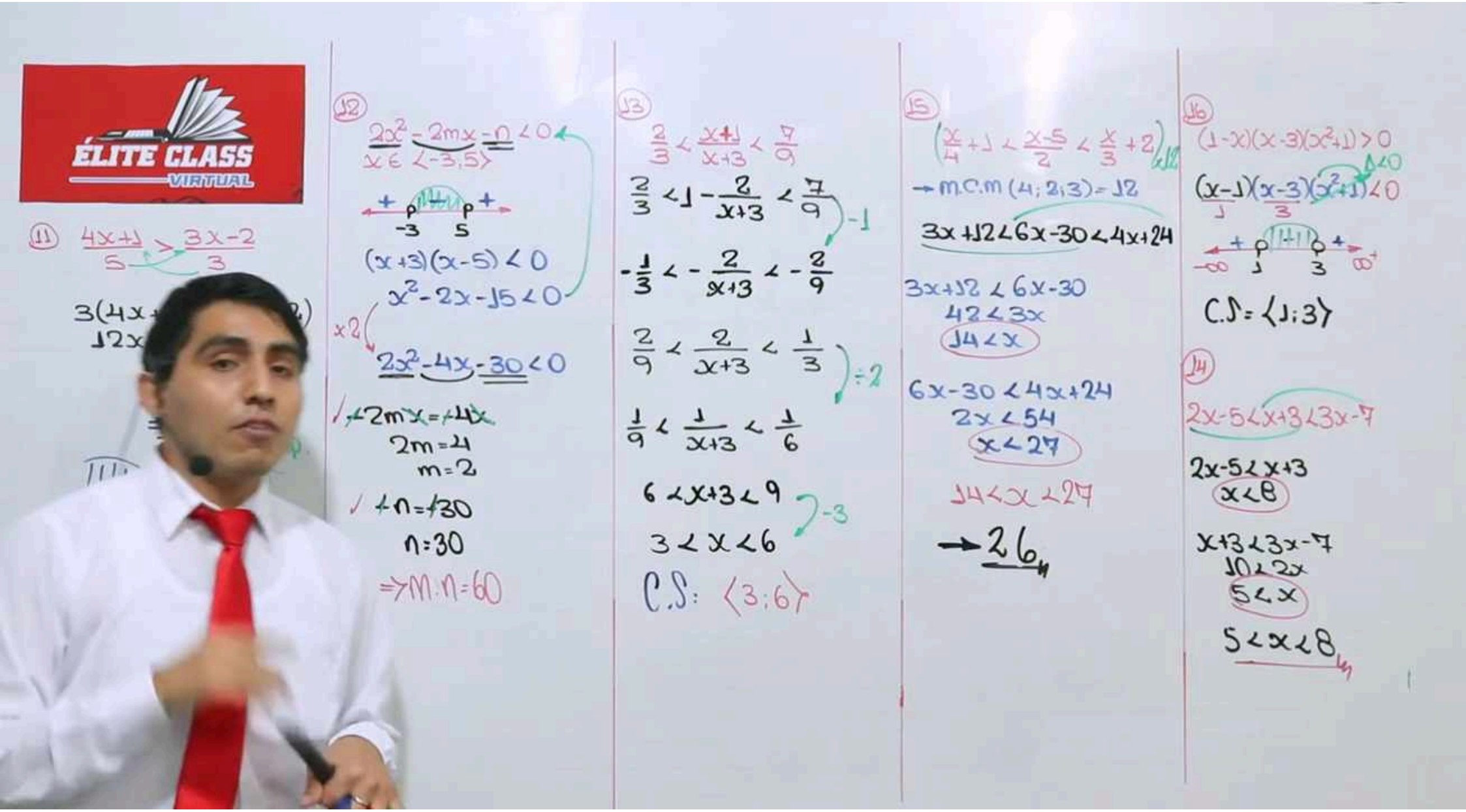
$2x < 54$

$x < 27$

$14 < x < 27$

→ 26

(16) $(1-x)(x-3)(x^2+1) > 0$


ÉLITE CLASS
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11
12
13
15
16
14

ÉLITE CLASS VIRTUAL

17) $(x^2+7)(x^2+25)(x^2-9) \leq 0$

$\Delta < 0$ $\Delta < 0$

$(x^2+7)(x^2+25)(x+3)(x-3) \leq 0$

-3 3

$C.S: [-3;3]$

18) $(x^2-x+6)(x^2-x-6)(x-1)^2(x+4)^6 \leq 0$

$\Delta < 0$ $=0$ $=0$

$x^2-x-6 \leq 0$

$(x-3)(x+2) \leq 0$

3 -2

$x-1=0$ $\quad$ $x+4=0$

$x=1$ $\quad$ $x=-4$

$C.S: [-2;3] \cup \{-4\}$

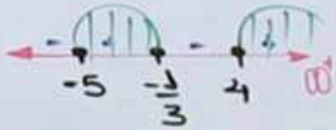
19) $(3x+1)^5(x-2)^2(x+5)^3(x-2)^4(4-x) \leq 0$

$=0$ $\quad$ $=0$

$(3x+1)(x+5)(4-x) \leq 0$

$(3x+1)(x+5)(x-4) \geq 0$

$-\frac{1}{3}$ -5 4



$x-2=0$

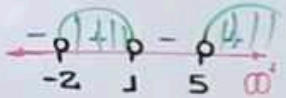
$x=2$

$C.S: [-5;-\frac{1}{3}] \cup [4;\infty\rangle \cup \{2\}$

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

$x-5$

5



$C.S: \langle -2;1\rangle \cup \langle 5;\infty\rangle$