EF3-Equazioni Fratte

domenica 19 luglio 2020 19:07

1) $\frac{1-x}{x^2-4x+3} - \frac{4}{9-x^2} + \frac{x-3}{x^2+4x+3} = -\frac{5}{3-x}$

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

N.B. è l'opposto del numeratore

Raccolgo (−) al numeratore

$9-x^2 = -(x^2-9) = -(x+3)(x-3)$ Raccolgo −

$x^2+4x+3 = (x+1)(x+3)$

$3-x = -(x-3)$ Raccolgo −

$\frac{-(x-1)}{(x-3)(x-1)} - \frac{4}{-(x+3)(x-3)} + \frac{x-3}{(x+1)(x+3)} = -\frac{5}{-(x-3)}$

$(-)\cdot(-) = +$ $\quad$ $(-)\cdot(-) = +$

N.B. PONI SUBITO LE C.E.

$x \neq \pm 3$

$x \neq \pm 1$

$\frac{-(x-1)}{(x-3)(x-1)} + \frac{4}{(x+3)(x-3)} + \frac{x-3}{(x+1)(x+3)} = \frac{5}{(x-3)}$ Sposto

$x \neq 1$

SEMPLIFICO

$\frac{-1}{x-3} + \frac{4}{(x+3)(x-3)} + \frac{x-3}{(x+1)(x+3)} = \frac{5}{(x-3)}$

$$\frac{}{x-3} + \frac{}{(x+3)(x-3)} + \frac{x-3}{(x+1)(x+3)} = \frac{5}{(x-3)}$$

$$-\frac{1}{x-3} + \frac{4}{(x+3)(x-3)} + \frac{x-3}{(x+1)(x+3)} - \frac{5}{x-3} = 0$$

$$\frac{-1\cdot(x+1)(x+3) + 4\cdot(x+1) + (x-3)^2 - 5\cdot(x+1)(x+3)}{(x+1)(x-3)(x+3)} = 0$$

$x \neq -1$ $\quad x \neq \pm 3$

2) $$\frac{1}{x} + \frac{2}{x^2 - x} > \frac{3}{x-1}$$

SCOMPONGO I DENOM.

$$\frac{1}{x} + \frac{2}{x(x-1)} - \frac{3}{x-1} > 0$$

C.E. $x \neq 0$
$x \neq 1$

DENOMIN. COMUNE

$$\frac{1\cdot(x-1) + 2 - 3\cdot x}{x(x-1)} > 0$$

CALCOLI AL

CALCOLI AL NUMERATORE!!! $x - 1 + 2 - 3x$

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

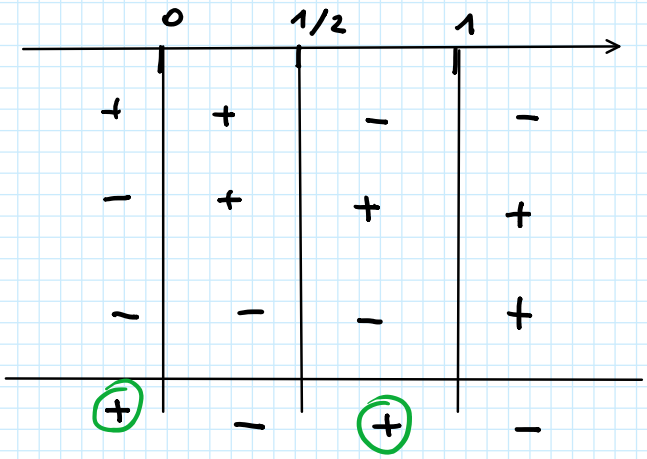
$-2x + 1 > 0$

$-2x > -1$

$2x < 1 \rightarrow x < 1/2$

$x > 0$

$x > 1$



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

PRENDO I ⊕

$x < 0 \quad \vee \quad \frac{1}{2} < x < 1$

3) $$\frac{x^4 - 5x^2 + 4}{x^3 - x} \leq 0$$

SCOMPONGO NUM.

$x^4 - 5x^2 + 4 \qquad x^2 = t$

$t^2 - 5t + 4$ TRINOMIO SP.

$(t-4)(t-1)$

$(x^2-4)(x^2-1)$ DIF. DI QUAD.

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

DENOM $x^3 - x$ TOTALE

$= x(x^2-1)$ DIFF. Q

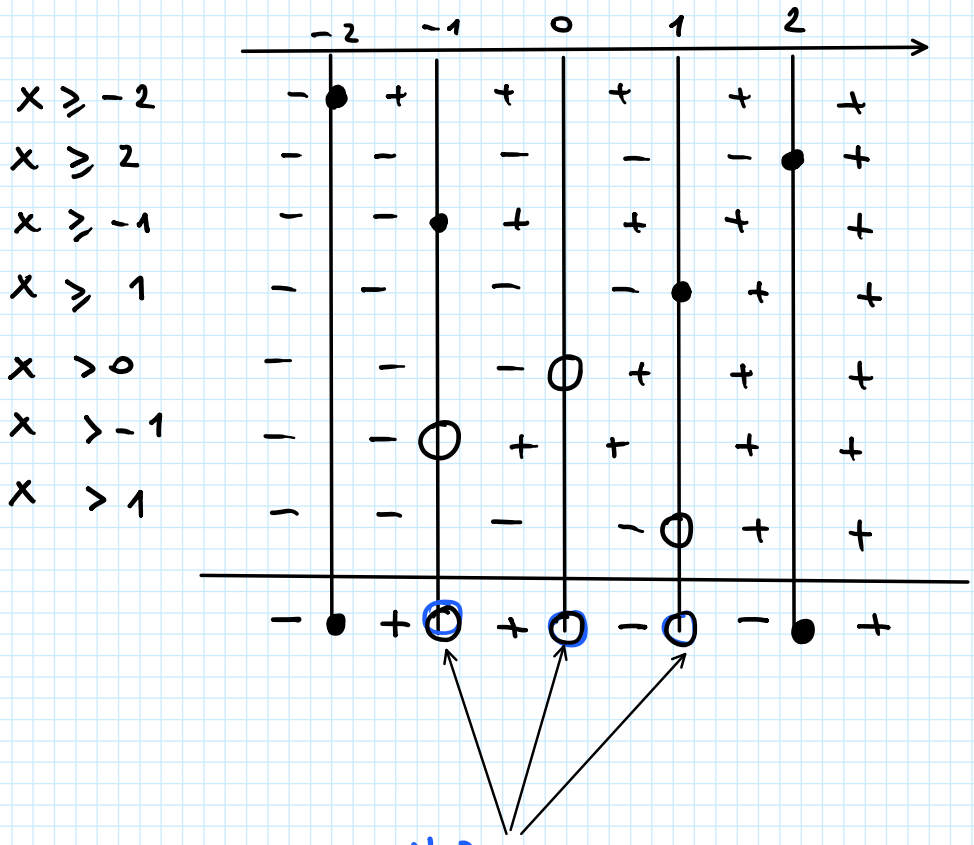
$= x(x+1)(x-1)$

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

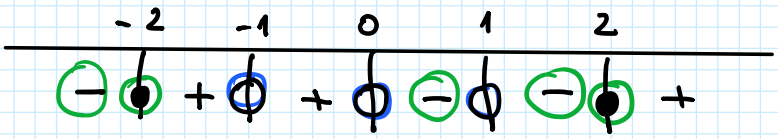
2 MODI

1° MODO → studio tutti i fattori. ≥ 0

(denom. solo > 0)



N.B NON LI PRENDO SONO AL DENOM.



sol.

≤ 0 $\quad x \leq -2 \vee 0 < x < 1 \vee 1 < x \leq 2$

2° MODO