

$$f(x) = \frac{6-x}{x^2-7x+10}$$

C.E.  $x^2 - 7x + 10 \neq 0$  quindi risolviamo

$$x^2 - 7x + 10 = 0 \quad \Delta = 49 - 40 = 9$$

$$x_{1,2} = \frac{+7 \pm 3}{2} \quad \left\{ \begin{array}{l} 2 \\ 5 \end{array} \right.$$

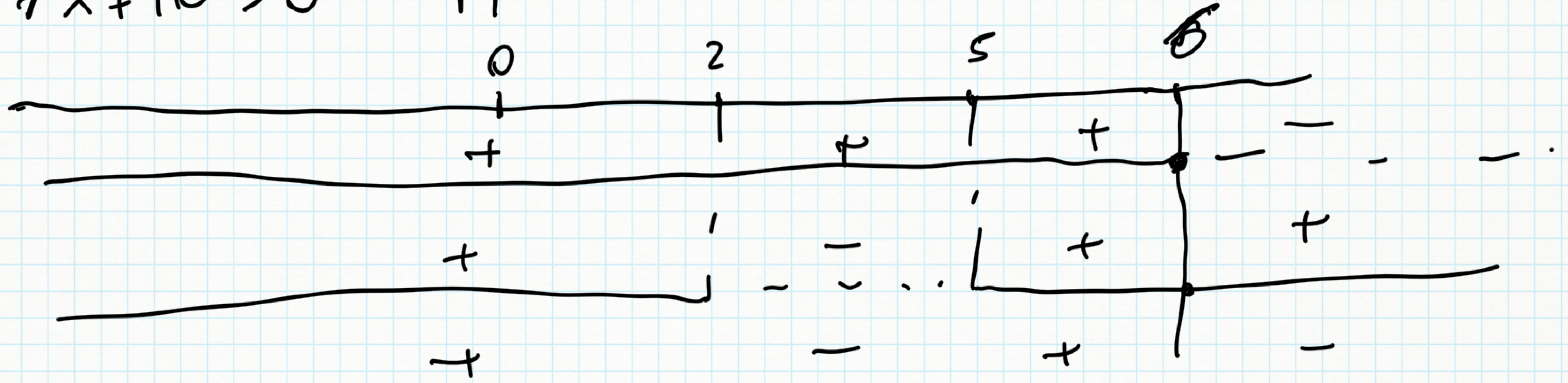
C.E.  $] -\infty; 2[ \cup ] 2; 5[ \cup ] 5; +\infty [$



Positivität

$$\begin{cases} 6 - x \geq 0 \\ x^2 - 7x + 10 > 0 \end{cases}$$

$$\begin{cases} x \leq 6 \\ x < 2 \quad x > 5 \end{cases}$$



Positiva

per

$$x < 2$$

e

$$5 < x < 6$$



Limiti agli estremi del campo d'esistenza

$$\lim_{x \rightarrow -\infty} \frac{6-x}{x^2-7x+10} = 0$$

grado D > grado N

$$\lim_{x \rightarrow +\infty} \frac{6-x}{x^2-7x+10} = 0$$

$$Y=0$$

ASINT. OR.  
A DX e SX.

Utilizzando lo studio della positività  
possiamo facilmente dedurre che



$$\lim_{x \rightarrow 2^-} \frac{6-x}{x^2-7x+10} = +\infty$$

$x=2$  AS. VERTICALE

$$\lim_{x \rightarrow 2^+} \frac{6-x}{x^2-7x+10} = -\infty$$

$$\lim_{x \rightarrow 5^-} \frac{6-x}{x^2-7x+10} = -\infty$$

$x=5$  AS. VERTICALE

$$\lim_{x \rightarrow 5^+} \frac{6-x}{x^2-7x+10} = +\infty$$



CRESCENZA

$$f(x) = \frac{6-x}{(x^2-7x+10)}$$

$$f'(x) = \frac{-(x^2-7x+10) - (6-x)(2x-7)}{(x^2-7x+10)^2} =$$

$$= \frac{-x^2+7x-10 - (12x-42-2x^2+7x)}{(x^2-7x+10)^2} =$$

$$= \frac{-x^2 + \cancel{7x} - 10 - 12x + 42 + 2x^2 - \cancel{7x}}{(x^2-7x+10)^2} =$$



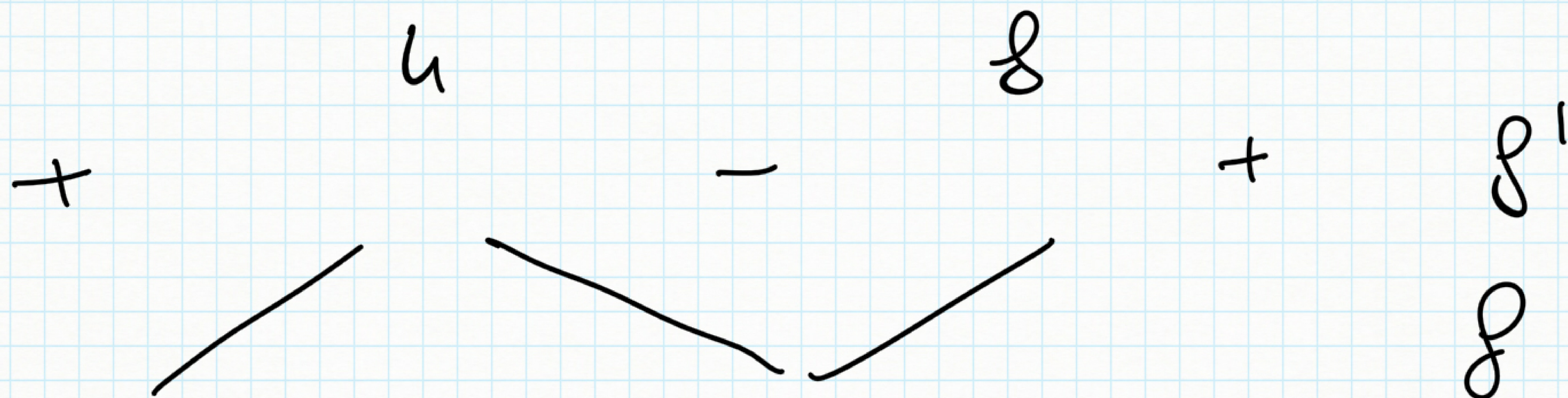
$$f'(x) = \frac{x^2 - 12x + 32}{(x^2 - 7x + 10)^2}$$

frattione con denominatore positivo nel campo  
d'esistenza cioè

$$x^2 - 12x + 32 \geq 0 \quad \Delta = 144 - 128 = 16$$

$$x_{1,2} = \frac{+12 \pm 4}{2} \begin{cases} 8 \\ 4 \end{cases} \quad x \leq 4 \quad x \geq 8$$





$x$	punto	↓	máximo	relativo	$f(4) = -1$	máximo	relativo
$f$	,	↑	mínimo	"	$f(8) = -\frac{1}{3}$	mínimo	relativo



CONVESSITÀ

$$f'(x) = \frac{x^2 - 12x + 32}{(x^2 - 7x + 10)^2}$$

$$f''(x) = \frac{(2x - 12)(x^2 - 7x + 10)^2 - (x^2 - 12x + 32) \cdot 2(x^2 - 7x + 10)(2x - 7)}{(x^2 - 7x + 10)^4}$$

$$= \frac{2(x^2 - \cancel{7x} + 10)}{(x^2 - 7x + 10)^4} \left[ (x - 6)(x^2 - 7x + 10) - (x^2 - 12x + 32)(2x - 7) \right] =$$



$$= \frac{2}{(x^2 - 7x + 10)^3} \left[ x^3 - 7x^2 + 10x - 6x^2 + 42x - 60 - (2x^3 - 7x^2 - 26x^2 + 84x + 64x - 224) \right]$$

$$= \frac{2}{(x^2 - 7x + 10)^3} \left[ \underline{x^3} - \cancel{7x^2} + 10x - \underline{6x^2} + \underline{42x} - 60 - \underline{2x^3} + \cancel{7x^2} + \underline{26x^2} - \underline{84x} - \underline{64x} + 224 \right]$$

$$= \frac{2}{(x^2 - 7x + 10)^3} \left[ -x^3 + 18x^2 - 96x + 164 \right]$$



