$S = S_1 \cup S_2$

DATA

$S = \{x \in \mathbb{R} / x > 6\}$

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c) $x^{x^2-x-2} \geq x^4$

É necessário verificar 3 casos:

1º caso: verificar se $x=0$ ou $x=1$ são soluções particulares:

$x=0 \rightarrow 0^{0^2-0-2} \geq 0^4 \rightarrow 0^{-2} \geq 0^4$ (Falso) não é solução

$x=1 \rightarrow 1^{1^2-1-2} \geq 1^4 \rightarrow 1^{-2} \geq 1^4$ (verdade) É solução

$S_1 = \{0, 1\}$

2º caso, se base for maior que 1:

$x > 1$ (I)

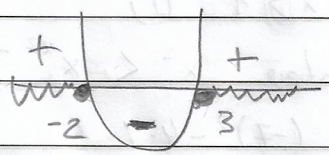
Então $x^{x^2-x-2} \geq x^4 \rightarrow x^2-x-2 \geq 4 \rightarrow x^2-x-6 \geq 4$ (II)

$\Delta = (-1)^2 - 4 \cdot 1 \cdot (-6)$

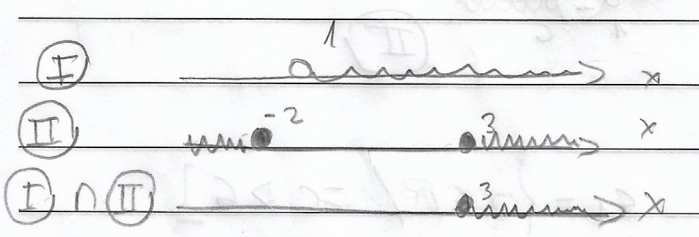
$\Delta = 1 + 24$

$\Delta = 25 \quad \sqrt{\Delta} = 5$

$x = \frac{1 \pm 5}{2}$ $\quad x_1 = 3$, $x_2 = -2$



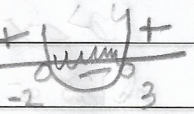
(II)



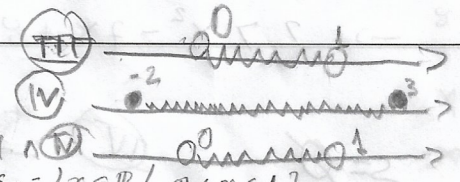
$S_2 = \{x \in \mathbb{R} / x \geq 3\}$

3º caso, se base for maior 0 e menor 1

$0 < x < 1$ então $x^{x^2-x-2} > x^4$ $\begin{cases} x^2-x-2 < 4 \\ x^2-x-6 < 0 \end{cases}$



(III)



$S_3 = \{x \in \mathbb{R} / 0 < x < 1\}$

$S = S_1 \cup S_2 \cup S_3$

$S = \{x \in \mathbb{R} / 0 < x \leq 1 \text{ ou } x \geq 3\}$ //