$$\log_{10}(0,5) = -\log_{10} 2$$

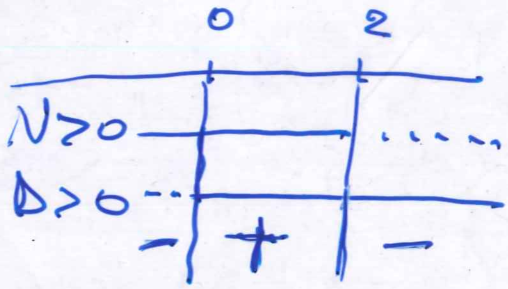
$$\log_{10}\left(\frac{1}{2}\right) = \log_{10} 1 - \log_{10} 2 = 0 - \log_{10} 2$$

$$\frac{2}{\log_8(x-6)} > 1 \iff \begin{cases} x > 6 \\ \dfrac{2}{\log_8(x-6)} - 1 > 0 \end{cases} \iff$$

$$\begin{cases} x > 6 \\ \dfrac{2 - \log_8(x-6)}{\log_8(x-6)} > 0 \end{cases}$$

$$t = \log_8(x-6)$$

$$\frac{2-t}{t} > 0$$



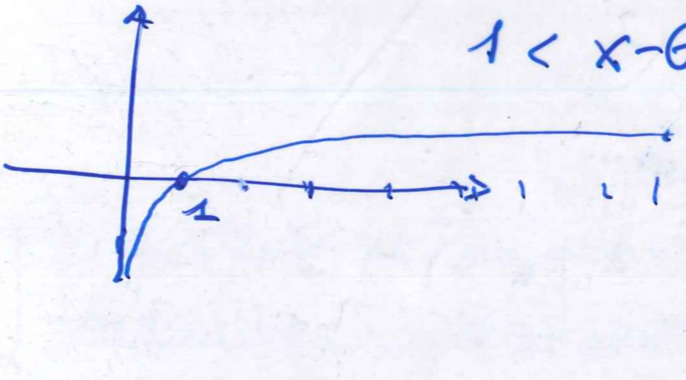
$$0 < \log_8(x-6) < 2$$

$$\downarrow 8^{y}$$

$$8^0 < 8^{\log_8(x-6)} < 8^2$$

$$1 < x-6 < 64$$

$\log_8$



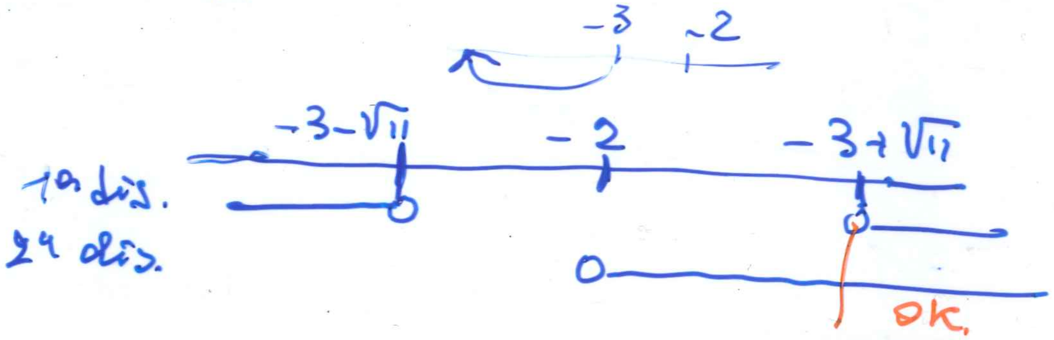
$$7 < x < 70$$

$$\boxed{x \in (7, 70)}$$

$$\log_{5}(x^2+6x-2) = 1 + \log_5(x+2)$$

I.D. $\begin{cases} x^2+6x-2>0 \\ x+2>0 \end{cases}$ $\quad x^2+6x-2=0 \quad x_{1,2}=\dfrac{-3\pm\sqrt{9+2}}{1}$

$\begin{cases} x<-3-\sqrt{11} \text{ oppure } x>-3+\sqrt{11} \\ x>-2 \end{cases}$



I.D. $(-3+\sqrt{11}, +\infty)$

Risolvo

$$\log_5(x^2+6x-2) - \log_5(x+2) = 1$$

$$\log_5\left(\frac{x^2+6x-2}{x+2}\right) = 1 \iff \frac{x^2+6x-2}{x+2} = 5^1$$

$$\iff \begin{cases} x>\sqrt{11}-3 \\ x^2+6x-2 = 5x+10 \end{cases} \iff \begin{cases} x>\sqrt{11}-3 \\ x^2+x-12=0 \end{cases}$$

$(x+4)(x-3)=0$

non sta nell' I.D.

La soluzione è unica!

$$x=3$$

$$\lim_{x\to 0} \frac{x^2\left(\left(\cos x/2\right)^2 - \left(\operatorname{sen} x/2\right)^2\right)}{2-2\cos x} =$$

$(\cos\alpha)^2 - (\operatorname{sen}\alpha)^2 =$
$= \cos 2\alpha$

$$= \lim_{x\to 0} \frac{x^2 \cos x}{2(1-\cos x)} = \left[\frac{0}{0}\right]$$

se $x \to 0$
$\cos x = 1 - \frac{x^2}{2} + o(x^2)$

$$= \lim_{x\to 0} \frac{\cancel{x^2}\cdot 1}{2\left(\cancel{1}-\cancel{1}+\frac{x^2}{2}+o(x^2)\right)} = \lim_{x\to 0} \frac{\cancel{x^2}}{\cancel{2}\cdot\frac{\cancel{x^2}}{\cancel{2}}} = 1$$

$$\lim_{x\to 0} \frac{e^x + e^{-x} - 2}{3x^2} = \left[\frac{0}{0}\right]$$

se $x \to 0$
$e^x = 1 + x + o(x)$
$e^{-x} = 1 - x + o(x)$

$$\frac{\cancel{1}+\cancel{x}+o(x)+\cancel{1}-\cancel{x}+o(x)-\cancel{2}}{3x^2} = \frac{o(x)}{3x^2} \; ?$$

$e^x = 1 + x + \frac{x^2}{2} + o(x^2)$ $\qquad$ $e^t = 1 + t + \frac{t^2}{2} + o(t^2)$
$\qquad$ $t = -x$

$e^{-x} = 1 - x + \frac{x^2}{2} + o(x^2)$

(approssimazioni di Mc Laurin di e^x)

$$= \lim_{x\to 0} \frac{\cancel{2} + x^2 - \cancel{2} + o(x^2)}{3x^2} = \frac{1}{3}$$

oppure con il metodo di de l'Hospital

$$\lim_{x\to 0} \frac{(e^x + e^{-x} - 2)'}{(3x^2)'} = \lim_{x\to 0} \frac{e^x - e^{-x}}{6x} =$$

$$= \lim_{x\to 0} \frac{e^x + e^{-x}}{6} = \frac{1+1}{6} = \frac{1}{3}$$