

$$\sqrt{3(x^2-1)} \geq x^2-1 \quad [-2 \leq x \leq -1 \vee 1 \leq x \leq 2]$$

$$\textcircled{1} \begin{cases} x^2-1 < 0 \\ \sqrt{3(x^2-1)} \geq 0 \end{cases}$$

$$\textcircled{2} \begin{cases} x^2-1 \geq 0 \\ \sqrt{3(x^2-1)} \geq (x^2-1)^2 \end{cases}$$

$$\textcircled{1} \begin{cases} -1 < x < 1 \\ \emptyset \\ x \leq -1 \vee x \geq 1 \end{cases}$$

$$\textcircled{2} \begin{cases} x \leq -1 \vee x \geq 1 \\ 3x^2-3 \geq x^4+1-2x^2 \end{cases}$$

$$\begin{cases} x \leq -1 \vee x \geq 1 \\ x^4-5x^2+4 \leq 0 \quad t=x^2 \end{cases}$$

$$t^2-5t+4 \leq 0$$

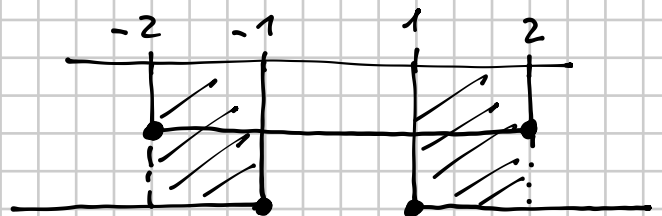
$$(t-4)(t-1) \leq 0$$

$$1 \leq t \leq 4$$

$$1 \leq x^2 \leq 4$$

$$\begin{cases} x^2 \leq 4 \\ x^2 \geq 1 \end{cases} \begin{cases} -2 \leq x \leq 2 \\ x \leq -1 \vee x \geq 1 \end{cases}$$

$$\begin{cases} -2 \leq x \leq 2 \\ x \leq -1 \vee x \geq 1 \end{cases}$$



$$-2 \leq x \leq -1 \vee 1 \leq x \leq 2$$

$$\begin{cases} x \leq -1 \vee x \geq 1 \\ -2 \leq x \leq -1 \vee 1 \leq x \leq 2 \end{cases} \Rightarrow$$

$$\boxed{-2 \leq x \leq -1 \vee 1 \leq x \leq 2}$$

$$\sqrt{x} + \sqrt{x-4} > \sqrt{2x-1}$$

$$\text{c.e.} \begin{cases} x \geq 0 \\ x-4 \geq 0 \\ 2x-1 \geq 0 \end{cases} \Rightarrow \begin{cases} x \geq 0 \\ x \geq 4 \\ x \geq \frac{1}{2} \end{cases} \Rightarrow x \geq 4$$

$$\begin{cases} \cancel{x} + \cancel{x-4} + 2\sqrt{x(x-4)} > \cancel{2x-1} \\ x \geq 4 \end{cases}$$

$$\begin{cases} 2\sqrt{x(x-4)} > 3 \\ x \geq 4 \end{cases}$$

$$\begin{aligned} 2\sqrt{x(x-4)} &> 3 \\ 4x(x-4) &> 9 \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{devo al quadrato}$$

$$4x^2 - 16x - 9 > 0$$

$$\frac{\Delta}{4} = 64 + 36 = 100$$

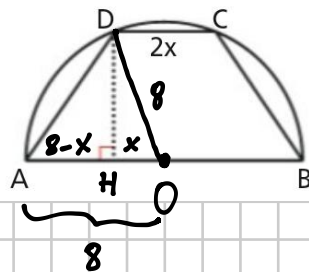
$$x = \frac{8 \pm 10}{4} = \begin{cases} -\frac{1}{2} \\ \frac{9}{2} \end{cases} \quad x < -\frac{1}{2} \vee x > \frac{9}{2}$$

$$\begin{cases} x < -\frac{1}{2} \vee x > \frac{9}{2} \\ x \geq 4 \end{cases}$$

$$\Rightarrow \boxed{x > \frac{9}{2}}$$

Trova per quali valori di x , in centimetri, il lato AD del trapezio isoscele $ABCD$ ha lunghezza maggiore del raggio della semicirconferenza, che è 8 cm.

$$[0 < x < 4]$$



Per dare senso al problema deve essere $0 < x < 8$

$\overline{AD} > 8$ disequazione che risolve

Devo esprimere \overline{AD} in funzione di x

$$\overline{DH}^2 = 8^2 - x^2 = 64 - x^2 \quad (\text{TH. PITAGORA})$$

$$\begin{aligned} \overline{AD} &= \sqrt{\overline{DH}^2 + \overline{AH}^2} = \sqrt{64 - x^2 + (8-x)^2} = \sqrt{64 - x^2 + 64 + x^2 - 16x} = \\ &= \sqrt{128 - 16x} \end{aligned}$$

$$\begin{cases} \sqrt{128 - 16x} > 8 \\ 0 < x < 8 \end{cases} \quad \begin{cases} 4\sqrt{8-x} > 8^2 \\ 0 < x < 8 \end{cases} \quad \begin{cases} \sqrt{8-x} > 2 \\ 0 < x < 8 \end{cases}$$

$$\begin{cases} 8-x > 4 \\ 0 < x < 8 \end{cases} \quad \begin{cases} x < 4 \\ 0 < x < 8 \end{cases} \Rightarrow \boxed{0 < x < 4}$$