

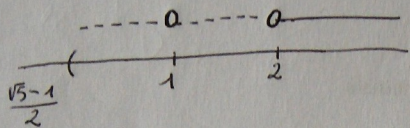
4.

$$CE \quad x - \sqrt{|x-1|} > 0 \Leftrightarrow \sqrt{|x-1|} < x \Leftrightarrow \begin{cases} x \geq 0 \\ |x-1| < x^2 \end{cases}$$

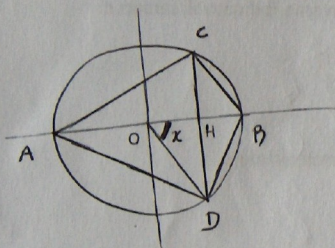
$$\Leftrightarrow \begin{cases} x \geq 0 \\ x-1 < x^2 \\ x-1 > -x^2 \end{cases} \Leftrightarrow \begin{cases} x \geq 0 \\ x^2 - x + 1 > 0 \\ x^2 + x - 1 > 0 \end{cases} \Leftrightarrow x > \frac{\sqrt{5}-1}{2}$$

$$SGN \quad f(x) \geq 0 \Leftrightarrow \begin{cases} x > \frac{\sqrt{5}-1}{2} \\ x - \sqrt{|x-1|} \geq 1 \end{cases} \Leftrightarrow \begin{cases} x > \frac{\sqrt{5}-1}{2} \\ \sqrt{|x-1|} \leq x-1 \end{cases}$$

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



5.



$$\begin{aligned} OH &= \cos x \\ DH &= \sin x \\ CD &= 2 \sin x \\ AH &= 1 + \cos x \\ BH &= 1 - \cos x \end{aligned}$$

$$0 < x < \frac{\pi}{2}$$

$$\text{Area}(ACD) = \frac{CD \cdot AH}{2} = \sin x (1 + \cos x)$$

$$\text{Area}(BCD) = \frac{CD \cdot BH}{2} = \sin x (1 - \cos x)$$

$$\text{differenza aree} = 2 \sin x \cos x = \sin 2x$$

$$\text{Massima per } 2x = \frac{\pi}{2} \text{ cioè } x = \frac{\pi}{4}$$