

*Answer on Question #76275 – Math – Algebra*

*Question*

Find domain and range of  $f(x)$ :

$$f(x) = \frac{1}{\sqrt{x - |x|}}$$

*Solution*

i) Domain ( $D(f)$ ):

$$\begin{cases} \sqrt{x - |x|} \neq 0 \\ x - |x| \geq 0 \end{cases} \Leftrightarrow x - |x| > 0$$

If  $x > 0$ , then

$$x - x > 0$$

$0 > 0$  – incorrectly

↓

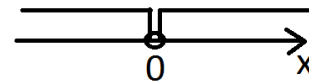
$$x \in \emptyset$$

If  $x < 0$ , then

$$\begin{cases} x + x > 0 \\ x < 0 \end{cases}$$

$$\begin{cases} 2x > 0 \\ x < 0 \end{cases}$$

$$\begin{cases} x > 0 \\ x < 0 \end{cases}$$



↓

$$x \in \emptyset$$

$$D(f) = \emptyset$$

ii) Range ( $E(f)$ ):

Because  $D(f) = \emptyset$  (does not exist),  $E(f) = \emptyset$  (does not exist either).

**Answer:**  $D(f) = \emptyset$ ;  $E(f) = \emptyset$ .