



الف) $x^2 - 4x + 2 > 0$
 $(x-2)(x-1) > 0$
 $\begin{array}{c} 2 \quad 1 \\ + \quad - \quad + \end{array}$
 $\mathbb{R} = (-\infty, 1) \cup (2, \infty)$

ب) $x^2 - 4x + 4 < 0$
 $(x-1)(x-3) < 0$
 $\begin{array}{c} 1 \quad 3 \\ + \quad - \quad + \end{array}$
 $\mathbb{R} = (1, 3)$

ج) $x^2 + 4x + 4 > 0$
 $(x+1)(x+3) > 0$
 $\begin{array}{c} -1 \quad -3 \\ - \quad - \quad - \end{array}$
 $\mathbb{R} = (-\infty, -3] \cup [-1, \infty)$

د) $x^2 - 4x + 4 \leq 0$
 $(x-1)(x-3) \leq 0$
 $\begin{array}{c} 1 \quad 3 \\ + \quad - \quad + \end{array}$
 $[1, 3]$

الف) $\frac{x^2 - 3x + 2}{x-1} < 0$
 $\frac{(x-2)(x-1)}{x-1} < 0$
 $\begin{array}{c} 1 \quad 2 \quad 1 \\ - \quad + \quad - \end{array}$
 $\Rightarrow x \in (-\infty, 1) \cup (2, \infty)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 4} > 0$
 $\frac{(x-1)(x+1)}{(x-2)^2} > 0$
 $\begin{array}{c} -1 \quad 2 \quad 2 \\ + \quad - \quad - \end{array}$
 $x \in (-\infty, -1] \cup (2, \infty)$

ج) $y = \sqrt{\frac{x^2 - 1}{x^2 - x^2}}$
 $\frac{x^2 - 1}{x(x-1)}$
 $\begin{array}{c} -1 \quad 1 \\ + \quad - \quad + \end{array}$
 $\mathbb{R} = (-\infty, -1) \cup (0, 1) \cup (1, \infty)$

د) $y = \sqrt{\frac{x^2 - 14}{x^2 - 4x + 4}}$
 $\frac{(x+4)(x-4)}{(x-2)^2}$
 $\begin{array}{c} -4 \quad 2 \quad 2 \\ + \quad - \quad - \end{array}$
 $\mathbb{R} = (-\infty, -4] \cup (2, \infty) - \{2\}$

الف) $y = \sqrt{4 - \sqrt{4-x}}$
 $\begin{cases} 4 - \sqrt{4-x} \geq 0 \\ 4 - \sqrt{4-x} \geq 0 \end{cases}$
 $\mathbb{R} = [-4, 4]$
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ب) $y = \sqrt{4 - \sqrt{4-x}}$
 $\begin{cases} 4 - \sqrt{4-x} \geq 0 \\ 4 - \sqrt{4-x} \geq 0 \end{cases}$
 $\mathbb{R} = [4, 11]$
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 $\mathbb{R} = [4, 11]$

$y = \sqrt{x - 2m^2}$ $x - 2m^2 \geq 0 \rightarrow x \geq 2m^2 \rightarrow x \leq 2$
 $\text{Def} = (-\infty, \sqrt{2}]$

$y = \sqrt{x|m| - 9}$ $x|m| - 9 \geq 0 \rightarrow x|m| \geq 9 \rightarrow \begin{cases} m > 0 \\ m < 0 \end{cases} \begin{cases} x \geq \frac{9}{m} \\ x \leq \frac{9}{m} \end{cases}$
 $\text{Def} = (-\infty, -\frac{9}{m}] \cup [\frac{9}{m}, +\infty)$

$y = \sqrt{\frac{|x|+1}{|x|-1}}$ $\frac{|x|+1}{|x|-1} \geq 0 \rightarrow x \neq \pm 1$ $\text{Def} = \mathbb{R} - \{\pm 1\}$

$y = \sqrt{\frac{x+1}{x-1}}$ $\frac{x+1}{x-1} \geq 0 \rightarrow x \neq 1$ $\text{Def} = (-\infty, +\infty) - \{1\}$

$y = \frac{\sin x}{\cos x - 1} \neq 0$ $\cos x \neq \frac{1}{2}$ $\text{Def} = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$

$y = \frac{\cos x + 1}{\sin x + 1} \neq 0$ $\sin x \neq -1$ $\text{Def} = \mathbb{R} - \{2k\pi + \frac{3\pi}{2}\}$

$y = \frac{\tan x + 1}{\cot x - 1} \neq 0$ $\cot x \neq 1$ $\text{Def} = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$

$y = \frac{\sin x + 1}{\cos x - 1} \neq 0$ $\cos x \neq 1$ $\text{Def} = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$

$y = \frac{1}{\sqrt{x^2 - 1 - \frac{1}{x}}}$ $x^2 - 1 - \frac{1}{x} > 0 \rightarrow x^2 - 1 > \frac{1}{x} \rightarrow |x - 1| > \frac{1}{x}$
 $\text{Def} = (-\infty, \frac{1}{x}) \cup (\frac{1}{x}, +\infty)$

$y = \sqrt{x - 2|m|}$ $x - 2|m| \geq 0 \rightarrow x \geq 2|m| \rightarrow \begin{cases} m \leq 0 \\ m > 0 \end{cases} \begin{cases} x \geq -2 \\ x \geq 2 \end{cases}$
 $\text{Def} = [-2, 2]$

$y = \sqrt{\frac{|x|}{|x|}}$ $\frac{|x|}{|x|} \geq 0$
 $\text{Def} = \mathbb{R} - \{0\}$

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