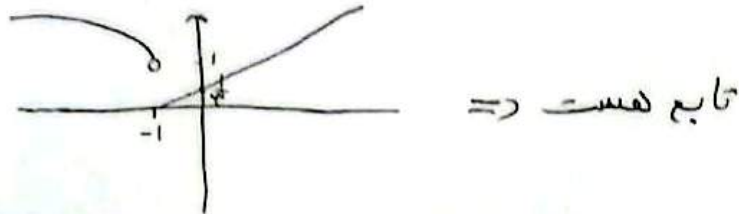
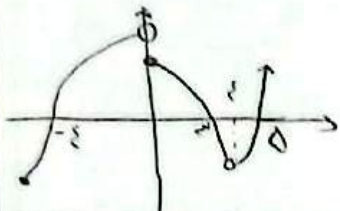


$$x = \begin{cases} y-1 & y \geq 0 \\ -y^2 & y > 1 \end{cases} \quad \begin{matrix} y-1 = x & y = \frac{x+1}{2} & y \geq 0 \Rightarrow x \geq -1 \\ y > 1 & y = \sqrt{-x} & y > 1 \Rightarrow x < -1 \end{matrix}$$



$$g(x) = \frac{\sqrt{x f(x-2)}}{f(x)} \quad D_f = (-4, -2] \cup [0, 3) \cup [7, +\infty)$$



$$\left. \begin{matrix} x \leftarrow \text{ضرب} \\ \Delta \text{ و } 0 \leftarrow f(0) \\ \Delta \text{ و } 0 \leftarrow f(x-2) \end{matrix} \right\} \frac{0}{-}$$

$$\begin{matrix} -4 & -2 & 0 & 3 & 7 \\ - & + & - & + & - \\ - & + & - & + & - \end{matrix}$$

$$f(x) = \frac{x^2 - 5x + 2}{x^2 - 4} = \frac{x^2 - 5x + 2}{x(x-4)}$$

$$D_f = \mathbb{R} - \left\{ \frac{5 \pm \sqrt{17}}{2} \right\}$$

$$\Delta = 9 - 17 < 0 \Rightarrow \text{همواره مثبت}$$

$$\sqrt{f(x)} = \sqrt{\frac{x^2 - 5x + 2}{x(x-4)}} \Rightarrow D_{\sqrt{f}} = (-2, 0) \cup (4, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{x-2}{x^2 - 4x - 8}} = \sqrt{\frac{x-2}{(x-4)(x+2)}} \quad D_f = (-2, +\infty) - \{2\}$$

$$\text{ب) } y = \frac{x^2 + 1}{x - 2} \Rightarrow D_f = \mathbb{R} - \left\{ \frac{1 \pm \sqrt{5}}{2} \right\}$$

$$\Delta = 1 - 4 < 0 \Rightarrow \text{همواره مثبت}$$

$$\text{الف) } f(x) = \frac{\sqrt{x(x^2 - 1)}}{\sqrt{|x| + 2}} \quad x(x^2 - 1) \geq 0 \quad |x| + 2 > 0$$

$$\Rightarrow D_f = [1, +\infty)$$

$$\text{ب) } f(x) = \frac{\sqrt{|x-1| - x^2}}{|x| - 1} \quad |x-1| - x^2 \geq 0 \quad |x| - 1 \neq 0$$

$$\Rightarrow D_f = [-1, 1) - \{-1\}$$

$$|x| - 1 \neq 0 \quad |x| \neq 1 \quad x \neq \pm 1 \Rightarrow D_f = [-1, 1) - \{-1\}$$

$$1) y = \sqrt{(x-2)[x-2]}$$

براکت کی عبارت یا خود عبارت
هم علامت است $\Rightarrow D_f = \mathbb{R}$

$$2) y = \sqrt{(x-1)[x-3]} \quad \begin{matrix} (-2, 1) [x-1] \text{ منفی} \\ (1, 3) [x-3] \text{ منفی} \end{matrix} \Rightarrow D_f = [3, +\infty) + \{1\}$$

$$y = \frac{1}{||x-2|-1| - k} \quad D_f = \mathbb{R} - \left\{ \frac{1}{k-1}, \frac{1}{k+1} \right\}$$

$$\begin{aligned} ||x-2|-1| - k &= 0 & |x-2|-1 &= k & |x-2| &= k+1 \rightarrow k = -1 \\ ||x-2|-1| &= k & -|x-2|+1 &= k & -k+1 &= |x-2| \rightarrow k = 1 \end{aligned}$$

if $k=1$ $x = 0$ and $x = 2$ $\Rightarrow \underline{k = +1}$
if $k=-1$ $\times$

$$f(x) = \frac{x^2 + 2x + 2}{x^2 + 3x + 2} \quad (x+2)(x+1) \neq 0 \quad x+1 \neq 0 \quad x-1 \neq 0$$

$$\Rightarrow x \neq -1 \text{ and } -2, 1$$

$$\begin{aligned} x^2 - 2(x) + 2(2) &= \\ x^2 - 4x + 8 &= (x-2)^2 \end{aligned}$$

دارای ریشه مضامیر

$$y = \log_{x+1} \log_{\frac{1}{x}} x$$

$x > 0$ and $x \neq 1$
 $\log_{\frac{1}{x}} x > 0 \rightarrow \frac{1}{x} > 1 \quad \times$
 $\frac{1}{x} < 1 \Rightarrow x < 1$
 $x+1 > 0 \quad x+1 \neq 1$
 $x > -1 \quad x \neq 0$

$$\Rightarrow x = (-1, 1) - \{0\}$$

$$D_f(x) = [-0.5, 3]$$

$$-0.5 \leq x \leq 3$$

$$D_f(x^2-1) = \left[-\frac{2}{\sqrt{e}}, \frac{2}{\sqrt{e}} \right]$$

$$D_{f(x^2-1)} = ?$$

$$-0.5 \leq x^2-1 \leq 3$$

$$-0.5 \leq x^2 \leq 4$$

$$-\frac{\sqrt{e}}{2} \leq x \leq \frac{\sqrt{e}}{2} \Rightarrow x^2 \leq \frac{e}{4} \rightarrow -\frac{\sqrt{e}}{2} \leq x \leq \frac{\sqrt{e}}{2}$$