

(1)

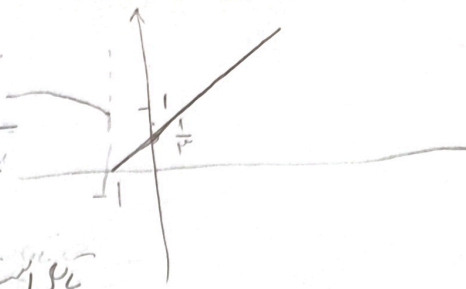
$$x = \begin{cases} y-1 & y > 0 \\ -y^2 & y < 0 \end{cases}$$

$$y-1=x \rightarrow y = \frac{x+1}{1}$$

$$-y^2=x \rightarrow y = \sqrt{-x}$$

برای  $x$  هر دو معادله یک جواب دارند

یعنی این دو منحنی همپوشانی دارند



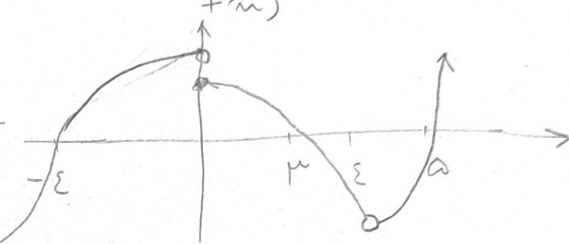
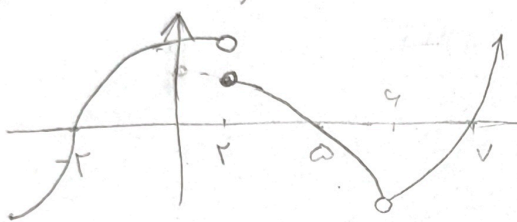
(2)

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

$$\begin{array}{cccccccc} -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\ -\frac{1}{2} & + & \phi & - & \phi & + & \phi & - & \phi & + \end{array}$$

$$D_f = (-2, -1) \cup [0, 2) \cup [4, +\infty)$$

$$\begin{array}{c} -2, 3, 4, 5 \\ -1, 1, 2 \end{array}$$



$$f(x) = \frac{x^2 - 3x + 2}{x^2 - 5x} = \frac{x^2 - 3x + 2}{x(x-5)}$$

$$\text{الف) } \mathbb{R} - \{-2, 0, 2\}$$

$$\text{ب) } \sqrt{\frac{x^2 - 3x + 2}{x^2 - 5x}} \quad \begin{array}{cccc} -2 & 0 & 2 \\ -\frac{1}{2} & + & \frac{1}{2} & - \end{array} \quad D_f = (-2, 0) \cup (2, +\infty)$$

(3)

$$\text{الف) } y = \sqrt{\frac{x-2}{x^2 - 2x^2 - 1}} = \sqrt{\frac{x-2}{(x^2 - 2)(x^2 + 1)}}$$

$$\begin{array}{cccc} -2 & 1 & 2 \\ -\frac{1}{2} & + & \frac{1}{2} & + \end{array}$$

$$D_f = (-2, +\infty) - \{1\}$$

(4)

$$\text{ب) } y = \frac{2x+1}{2-x}$$

$$2-x \neq 0 \rightarrow x \neq 2 \rightarrow [-x] = 2 \rightarrow 2 \leq -x < 3 \rightarrow -2 \geq x > -3$$

$$D_f = \mathbb{R} - (-2, 2]$$

(5)

$$\text{الف) } f(x) = \sqrt{x(x^2-1)}$$

$$\begin{array}{cccc} -1 & 0 & 1 \\ -\frac{1}{2} & + & \frac{1}{2} & - \end{array}$$

$$D_f = [-1, 0] \cup [1, +\infty)$$

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

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

$$\text{ب) } f(x) = \sqrt{|x-2| - x^2}$$

$$\begin{array}{c} \rightarrow x > 2 \quad \sqrt{-x^2 + x - 2} \rightarrow \sqrt{-(x^2 - x + 2)} \\ \rightarrow x \leq 2 \quad \sqrt{-x^2 - x + 2} \rightarrow \sqrt{-(x^2 + x - 2)} \end{array}$$

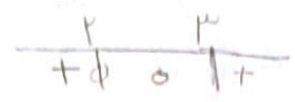
$$\begin{array}{c} \rightarrow \sqrt{-(x^2 - x + 2)} \rightarrow \sqrt{-(x^2 - x + 2)} \\ \rightarrow \sqrt{-(x^2 + x - 2)} \rightarrow \sqrt{-(x^2 + x - 2)} \end{array}$$

$$D_f = [-2, 1) - \{-1\}$$

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

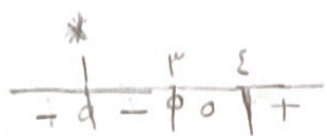
$r \leq x < r+1$



$$D_f = \mathbb{R}$$

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

$r \leq x < r+1$



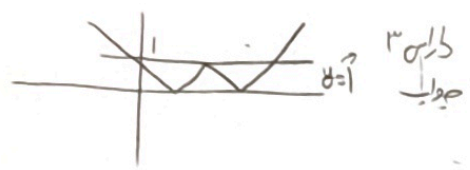
$$D_f = [r, +\infty) \cup \{1\}$$

7

$$y = \frac{1}{||x-r|-1|-k}$$

$$||x-r|-1| \neq k \Rightarrow |x-r|-1 \neq +k \Rightarrow |x-r| = k+1$$

$$|x-r|-1 \neq -k \Rightarrow |x-r| = -k+1$$



$$x = k+r, x = -k+r$$

$$x = -k+r, x = k+r$$

$$x = 0, r, \text{ and } k \leq 1$$

$k=1$  is a special case  
 $0 < k < 1$   
 $k=1$   
 $k > 1$

8

$$f(n) = \frac{x^r + km + r}{x^r + km + r} = \frac{(n+1)(n+r)}{(n+1)(n+r)} = \frac{(n+1)(n+r)(n-1)}{(n+1)^2(n+r)}$$

$$\log \frac{1}{n} \rightarrow -1 > -r > 1 \rightarrow n=r \rightarrow x^r - 4x + 9 = 0 \quad (x-r)^2 = 0 \Rightarrow x=r$$

9

$$\log \log \frac{1}{n+1}$$

$$\left. \begin{array}{l} x > 0 \\ x \neq 1 \\ x > -1 \end{array} \right\} \rightarrow x > 0 \rightarrow (0, 1) = D_f$$

$$x+1 \neq 1 \rightarrow x \neq 0$$

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$$D_{f(n)} = [-a, r]$$

$$D_{f(r, r, 1)} = ?$$

$$-a \leq \frac{1}{n^r} \leq r \xrightarrow{+1} -\varepsilon \leq \frac{1}{n^r} \leq \varepsilon \rightarrow -\frac{\varepsilon}{r} \leq n^r \leq \frac{\varepsilon}{r}$$

$$\Rightarrow -\frac{\varepsilon}{r} \leq n^r \leq \frac{\varepsilon}{r} \rightarrow -\frac{\sqrt[r]{\varepsilon}}{r} \leq n \leq \frac{\sqrt[r]{\varepsilon}}{r}$$