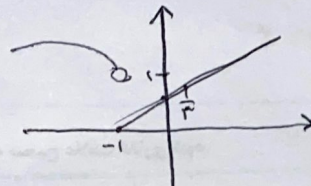


رسم گراف

$$u = \begin{cases} 2y-1 & y \geq 0 \rightarrow y \geq 0 \rightarrow 2y \geq 0 \rightarrow 2y-1 \geq -1 \rightarrow u \geq -1 \\ -y^2 & y < 0 \rightarrow y < 0 \rightarrow y^2 > 0 \rightarrow -y^2 < -1 \rightarrow u < -1 \end{cases} \quad (1)$$

$$y = \begin{cases} \frac{u+1}{2} & u \geq -1 \\ \sqrt{-u} & u < -1 \end{cases}$$



طبق شکل تابع است

$$y = \frac{u+1}{2} \rightarrow u = 2y-1 \rightarrow 2y = u+1 \rightarrow y = \frac{u+1}{2}$$

$$\sqrt{-u} = y \rightarrow u = -y^2 \rightarrow -u = y^2 \rightarrow y = \pm \sqrt{-u}$$

حالت منفی غیر قابل قبولی چون y باید بزرگتر از یک باشد

(2)

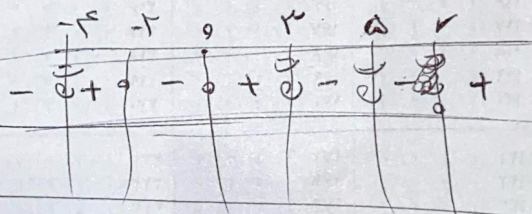
$$g(u) = \sqrt{\frac{u f(u-2)}{f(u)}} \rightarrow \frac{u f(u-2)}{f(u)} \geq 0$$

برای رسم $f(u)$ ابتدا دو دایره رسم می‌کنیم. $f(u)$ و $f(u-2)$ دو دایره به مرکزیت $u=1$ و $u=3$ به ترتیب. $f(u) = -x^2 + 2x$ و $f(u-2) = -x^2 + 4x - 2$

$$f(u) = -x^2 + 2x \rightarrow -x^2 + 2x = 0 \rightarrow x(2-x) = 0 \rightarrow x=0, 2$$

$$D_{f(u-2)} \neq \emptyset$$

$$D_g = (-2, 0) \cup (2, 4)$$



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

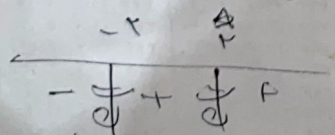
$$D_f = ? \rightarrow u^2 - 4u \neq 0 \rightarrow u(u-4) \neq 0 \rightarrow u \neq 0, 4$$

$$\sqrt{f(u)} = \sqrt{\frac{u^2 - 2u + 2}{u^2 - 4u}} \rightarrow \frac{u^2 - 2u + 2}{u^2 - 4u} \geq 0$$

$$u > 0, \Delta < 0$$

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

$$y = \sqrt{\frac{u-2}{u^2 - 2u - 2}} \rightarrow \frac{u-2}{u^2 - 2u - 2} \geq 0$$



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

$$u^2 - 2u - 2 = 0 \rightarrow u = 1 \pm \sqrt{3}$$

$$y = \frac{u^2 + 1}{u^2 - 2u - 2} \rightarrow u^2 - 2u - 2 \neq 0 \rightarrow u \neq 1 \pm \sqrt{3}$$

$$D_f = \mathbb{R} - \{1 - \sqrt{3}, 1 + \sqrt{3}\}$$

درسها رقی - a

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

$|x|+x \xrightarrow{x>0} 2x$
 $\xrightarrow{x=0} 0$
 $\xrightarrow{x<0} x-x$
 $\rightarrow x > 0$
 $D_f = [1, +\infty)$

$$\begin{array}{ccc} - & 1 & 0 & 1 \\ & - & + & - & + \end{array}$$

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

$|x-1|-x^2 \geq 0 \xrightarrow{x>0} x-1-x^2 \geq 0$
 $\xrightarrow{x<0} x^2+x-1 \geq 0$
 $(x+2)(x-1) \geq 0$
 $D_f = (-\infty, -1] \cup (1, +\infty)$

$$\begin{array}{ccc} - & 1 & 1 \\ & + & - & + \end{array}$$

ج) $g = \sqrt{(x-1)(x-2)} \leadsto (x-1)(x-2) \geq 0$

$|x-2|=0 \rightarrow 0.5x-2 \leq 1 \rightarrow 2.5x \leq 2$
 $D_g = \mathbb{R}$

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

د) $g = \sqrt{|x-1|(x-2)} \leadsto |x-1|(x-2) \geq 0$

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

$2.5x \leq 2 \rightarrow [2, +\infty) \cup \{1\}$
 $D_g = [2, +\infty) \cup \{1\}$

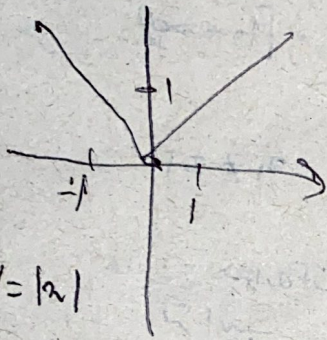
$x \neq 1$
 $x \neq 2$

∞) (

(

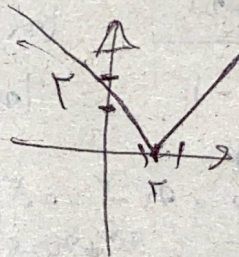
$$y = \frac{1}{|x-2|-1-k} \quad |x-2|-1-k \neq 0$$

خط $y=k$ کے نمودار $y=|x-2|-1$ سے بیرونی، بیرونی اور بیرونی کے قطعہ کے

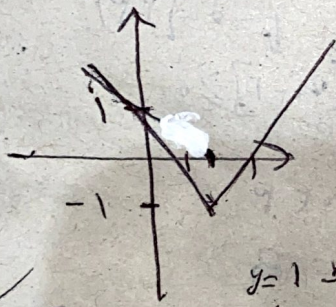


$$y = |x|$$

$$y = |x-2|-1$$

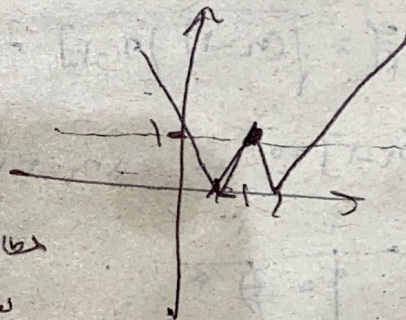


$$y = |x-2|-1$$



خط $y=1$ کے نمودار فقط $y=1$ کے نمودار کے قطعہ کے
 $y = |x-2|-1$ کے نمودار کے قطعہ کے
 $y=k \rightarrow y=1 \rightarrow k=1$

$$y = |x-2|-1$$



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

$$x^2 + 2x + 2 \neq 0 \rightarrow (x+1)(x+2) \neq 0 \rightarrow x \neq -1, x \neq -2$$

①

$$P_f = \{x - \{-2, -1\}\}$$

$$x^2 - 9x + 9 = 0 \rightarrow (x-3)^2 = 0 \rightarrow x = 3$$

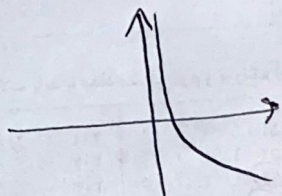
لے عبارت یکبارہ مضاعف دے

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

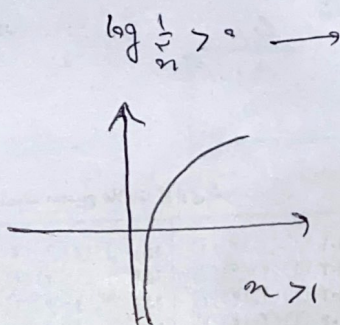
$$x^2 - 2x - 2$$

$$y = \log_{a+1} + \log \frac{1}{a} \rightarrow \begin{matrix} a+1 \neq 1 \rightarrow a \neq 0 \\ a+1 > 0 \rightarrow a > -1 \end{matrix}$$

$$\log \frac{1}{a} \rightarrow \begin{matrix} a > 0 \\ a \neq 1 \end{matrix}$$



$0 < a < 1$



$a > 1$

من باید سه معادله را
جواب دهم

$$0 < a < 1$$

$$f(x) \rightarrow D_{f(x)} = [-5, 3]$$

$$-5 \leq x^2 - 1 \leq 3 \rightarrow -4 \leq x^2 \leq 4 \rightarrow \begin{matrix} x^2 \leq 4 \\ x^2 \leq \frac{4}{3} \end{matrix}$$

$$D_f(x^2 - 1) =$$

$$\left[-\frac{2\sqrt{3}}{3}, \frac{2\sqrt{3}}{3} \right]$$

$$\frac{x^2}{3} \rightarrow \frac{-2}{\sqrt{3}} \leq x \leq \frac{2}{\sqrt{3}} \rightarrow \frac{2\sqrt{3}}{3} \geq x \geq \frac{-2\sqrt{3}}{3}$$