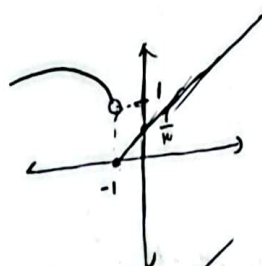


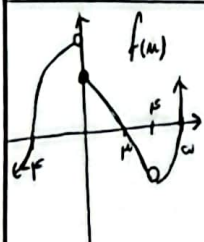
نام و نام خانوادگی: شماره: کلاس: (رسم) B.....

$$u = \begin{cases} 3y-1 & y \geq 0 \\ -y^2 & y < 0 \end{cases} \Rightarrow u = 3y-1 \Rightarrow y = \frac{u+1}{3} \Rightarrow u \geq -1$$

$$u = -y^2 \Rightarrow y^2 = -u \Rightarrow y = \sqrt{-u} \quad u \leq -1$$



با توجه به نموداری توان گفت که عبارت تابع است



$$g(u) = \frac{|u f(u-2)|}{f(u)} \Rightarrow \frac{u f(u-2)}{f(u)} = 0 \Rightarrow u = 0 \text{ و } f(u-2) = 0 \Rightarrow \begin{cases} u = -2 \\ u = 0 \\ u = 2 \end{cases}$$

$$f(u) = 0 \Rightarrow \begin{cases} u = -2 \\ u = 0 \\ u = 2 \end{cases} \Rightarrow \frac{-2}{-2} \frac{0}{0} \frac{2}{2} \frac{0}{0} \frac{0}{0} \frac{2}{2} \frac{0}{0} \frac{2}{2} \frac{0}{0} \frac{2}{2}$$

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

$$\text{الف) } f(u) = \frac{u^2 - 2u + 2}{u^2 - 2u} \Rightarrow u^2 - 2u \neq 0 \Rightarrow u(u-2) \neq 0 \Rightarrow u \neq 0 \quad u \neq 2 \quad u \neq -2$$

$$\Rightarrow Df = \mathbb{R} - \{-2, 0, 2\}$$

$$\text{ب) } |f(u)| = \sqrt{\frac{u^2 - 2u + 2}{u^2 - 2u}} \Rightarrow u^2 - 2u + 2 = 0 \Rightarrow \frac{1}{4}(u-1)^2 + \frac{7}{4} = 0 \Rightarrow \Delta < 0 \Rightarrow u \in \mathbb{R} \Rightarrow \text{همواره مثبت}$$

$$u^2 - 2u \neq 0 \Rightarrow \frac{-2}{-1} \frac{0}{0} \frac{2}{2} \Rightarrow Df' = (-2, 0) \cup (2, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{u-2}{u^2 - 2u - 8}} \Rightarrow u-2 = 0 \Rightarrow u = 2 \Rightarrow u^2 - 2u - 8 = 0 \Rightarrow u^2 - 2u - 8 = 0 \Rightarrow (u-4)(u+2) = 0 \Rightarrow u = 4 \text{ و } u = -2$$

$$\Rightarrow (t-4)(t+2) = 0 \Rightarrow \begin{cases} t = 4 \\ t = -2 \end{cases} \Rightarrow t = 4 \Rightarrow u^2 = 4 \Rightarrow u = \pm 2 \Rightarrow \frac{-2}{-2} \frac{0}{0} \frac{2}{2}$$

$$\Rightarrow Df = (-2, +\infty) - \{2\}$$

$$y = \frac{u^2 + 1}{u^2 - 2u} \Rightarrow u^2 - 2u \neq 0 \Rightarrow u(u-2) \neq 0 \Rightarrow u \neq 0 \quad u \neq 2 \Rightarrow \frac{1}{4}(u-1)^2 + \frac{3}{4} = 0 \Rightarrow \Delta < 0 \Rightarrow u \in \mathbb{R} \Rightarrow \text{همواره مثبت}$$

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

$$\text{و } u = -1 \Rightarrow \text{همواره مثبت} \Rightarrow \frac{-1}{-1} \frac{0}{0} \frac{1}{1} \Rightarrow u \neq 0 \Rightarrow u \geq 0 \Rightarrow Df = [0, +\infty)$$

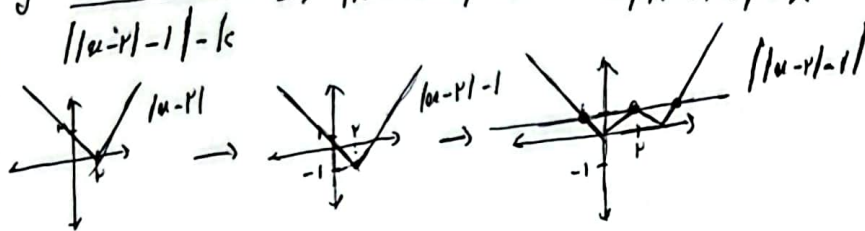
$$\text{ب) } f(u) = \sqrt{\frac{|u-2|-u^2}{|u|-1}} \Rightarrow |u-2| \neq 0 \Rightarrow |u| \neq 1 \Rightarrow u \neq \pm 1 \Rightarrow |u-2|-u^2 \geq 0$$

$$\Rightarrow |u-2| \geq u^2 \Rightarrow \begin{cases} u-2 \geq u^2 \Rightarrow u^2 + 2 - u \leq 0 \Rightarrow (u^2 + 2 - u) \leq 0 \Rightarrow \Delta < 0 \Rightarrow u \in \mathbb{R} \Rightarrow \text{همواره مثبت} \\ u-2 \leq -u^2 \Rightarrow u^2 + u - 2 \leq 0 \Rightarrow (u+2)(u-1) = 0 \Rightarrow u = -2 \text{ و } u = 1 \end{cases}$$

$$Df = (-2, 1) - \{-1\}$$

الف) $y = \sqrt{(u-2)(u-2)} \Rightarrow u-2=0 \Rightarrow u=2 \Rightarrow (u-2)=0 \Rightarrow (u)-2=0 \Rightarrow [u]=2 \Rightarrow 2 \leq u < 3$
 $\frac{2}{+} \frac{3}{+} \Rightarrow D_f = [2, 3)$

ب) $y = \sqrt{|u-1|(u-3)} \Rightarrow |u-1|=0 \Rightarrow u=1 \Rightarrow (u-3)=0 \Rightarrow 3 \leq u < 4$
 $\Rightarrow \frac{1}{-} \frac{3}{-} \frac{4}{+} \Rightarrow D_f = [3, 4)$

$y = \frac{1}{||u-2|-1|-1} \Rightarrow ||u-2|-1|-1=0 \Rightarrow ||u-2|-1|=1$


باقی به نمودار رسم شده فقط
 $u=1$ می توان استفاده کرد
 قطع شده را اضافه کرد بنابراین
 $u=1$ می باشد

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

$\Rightarrow u+1 \neq 0 \Rightarrow u \neq -1 \quad u-1 \neq 0 \Rightarrow u \neq 1 \Rightarrow D_f = \mathbb{R} - \{-1, 1\}$

$\Rightarrow u^2-2u+2=0 \Rightarrow n=2 \Rightarrow u^2-4u+4=0 \Rightarrow (u-2)^2=0 \Rightarrow u=2$ خفایه
 دارای یک ریشه می باشد

$y = \int_{u+1}^{\frac{1}{u}} \Rightarrow u+1 > 0 \Rightarrow u > -1 \quad u+1 \neq 1 \Rightarrow u \neq 0$
 $\Rightarrow \int_{u+1}^{\frac{1}{u}} \Rightarrow u > 0 \quad u \neq 1 \Rightarrow \int_{u+1}^{\frac{1}{u}} > 0 \Rightarrow 0 < u < 1$
 $\Rightarrow D_f = (0, 1)$

$D_{f(u)} = [-2, 3] \Rightarrow f(3u^2-1) \Rightarrow -2 \leq u \leq 3 \Rightarrow -2 \leq 3u^2-1 \leq 3 \Rightarrow 3u^2-1 \leq 3$
 $\Rightarrow 3u^2 \leq 4 \Rightarrow u^2 \leq \frac{4}{3} \Rightarrow -\frac{2}{\sqrt{3}} \leq u \leq \frac{2}{\sqrt{3}} \Rightarrow D_{f(3u^2-1)} = \left[-\frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}}\right]$