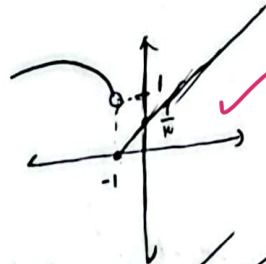


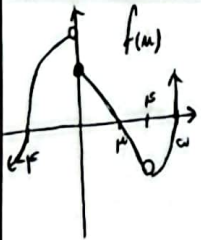
نام و نام خانوادگی: شماره: کلاس: (رسم) B.....

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

$$u = -y^3 \Rightarrow y^3 = -u \Rightarrow y = \sqrt[3]{-u} \quad u < 0$$



با توجه به نمودار می توان گفت که عبارت تابع است



$$g(u) = \frac{u f(u-1)}{f(u)} \Rightarrow \frac{u f(u-1)}{f(u)} = 0 \Rightarrow u = 0 \text{ و } f(u-1) = 0 \Rightarrow \begin{cases} u = -2 \\ u = 0 \\ u = 1 \end{cases}$$

$$f(u) = 0 \Rightarrow \begin{cases} u = -\epsilon \\ u = 3 \\ u = 0 \end{cases} \Rightarrow \begin{matrix} -\epsilon & -2 & 0 & 3 & 1 & 1 \\ -\frac{1}{3} & + & - & + & - & + \end{matrix}$$

$$Dg = (-\epsilon, -2] \cup (0, 3) \cup (1, +\infty)$$

فقط حواصت باشد که $u = 4$ در دامنه $f(u-1)$ نیست نه در بازه است آفره نیست

$$\text{الف) } f(u) = \frac{u^3 - 2u^2 + 1}{u^3 - \epsilon u} \Rightarrow u^3 - 2u^2 + 1 \neq 0 \Rightarrow u(u-2)(u+1) \neq 0 \Rightarrow u \neq 0 \quad u \neq 2 \quad u \neq -1$$

$$\Rightarrow Df = \mathbb{R} - \{-1, 0, 2\}$$

$$\text{ب) } |f(u)| = \sqrt{\frac{u^3 - 2u^2 + 1}{u^3 - \epsilon u}} \Rightarrow u^3 - 2u^2 + 1 = 0 \Rightarrow \frac{1}{u}(u^3 - 2u^2 + 1) \neq 0 \Rightarrow \Delta < 0 \quad u > 0 \Rightarrow \text{لداوه مثبت}$$

$$u^3 - \epsilon u \neq 0 \Rightarrow \begin{matrix} -2 & 0 & 2 \\ - & + & - \end{matrix} \Rightarrow Df' = (-2, 0) \cup (2, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{u-2}{u^2 - 2u - 1}} \Rightarrow u-2=0 \Rightarrow u=2 \Rightarrow u^2 - 2u - 1 = 0 \Rightarrow u^2 - 2u - 1 = 0 \Rightarrow u^2 - 2u - 1 = 0$$

$$\Rightarrow (t-2)(t+2) = 0 \Rightarrow \begin{cases} t=2 \\ t=-2 \end{cases} \Rightarrow t=2 \Rightarrow u^2 = 2 \Rightarrow u = \pm\sqrt{2} \Rightarrow \begin{matrix} -2 & 2 \\ - & + \end{matrix}$$

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

$$y = \frac{u^3 + 1}{\epsilon - 2(u)} \Rightarrow \epsilon - 2(u) \neq 0 \Rightarrow 2(-u) \neq \epsilon \Rightarrow (-u) \neq \frac{\epsilon}{2} \Rightarrow \frac{\epsilon}{2} - u < 3 \Rightarrow -3 < u \leq \frac{\epsilon}{2}$$

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

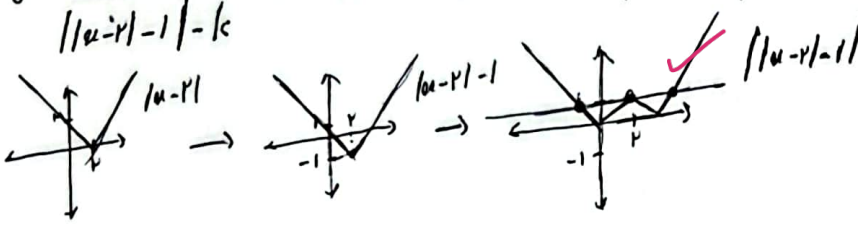
$$\text{الف) } f(u) = \frac{u(u^2-1)}{|u|+u} \Rightarrow u(u^2-1) = 0 \Rightarrow u=0 \quad u=1 \quad u=-1 \Rightarrow |u|+u=0 \Rightarrow |u|+u=0 \Rightarrow u=0$$

$$\text{و } u = -1 \Rightarrow \text{لداوه منفی / مثبت} \Rightarrow \begin{matrix} -1 & 0 & 1 \\ - & + & - \end{matrix} \Rightarrow u \neq 0 \Rightarrow u > 0 \Rightarrow Df = (0, +\infty)$$

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

$$\Rightarrow |u-2| > u^2 \Rightarrow \begin{cases} u-2 > u^2 \Rightarrow u^2 + 2 - u < 0 \Rightarrow (u^2 + 2 - u) < 0 \Rightarrow \Delta < 0 \quad u > 0 \\ u-2 < -u^2 \Rightarrow u^2 + u - 2 < 0 \Rightarrow (u+2)(u-1) = 0 \Rightarrow u = -2 \quad u = 1 \end{cases}$$

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

الف) $y = \sqrt{(u-2)(u-2)} \Rightarrow u-2=0 \Rightarrow u=2 \Rightarrow (u-2)=0 \Rightarrow (u)-2=0 \Rightarrow [u]=2 \Rightarrow 2 \leq u < 3$ $\frac{2}{+} \frac{3}{+} \frac{4}{+} \Rightarrow D_f = \mathbb{R} \checkmark$	1.75
ب) $y = \sqrt{ u-1 (u-3)} \Rightarrow u-1 =0 \Rightarrow u=1 \Rightarrow (u-3)=0 \Rightarrow 3 \leq u < 4$ $\Rightarrow \frac{1}{-1} \frac{3}{-1} \frac{4}{+} \Rightarrow D_f = [3, +\infty) \cup \{1\}$ $D_f = [3, +\infty) \cup \{1\}$ ریشه داخل قدر مطلق، عبارت را منفرد می کند!	6
$y = \frac{1}{ u-2 -1 -1}$ $\Rightarrow u-2 -1 -1=0 \Rightarrow u-2 -1 =1$  با توجه به نمودار رسم شده فقط $u=1$ می تواند در نقطه ی قطع شده را حذف کرد بنابراین $u=1$ می باشد	7
$f(u) = \frac{u^2+2u+2}{u^2+2u+2} \Rightarrow u^2+2u+2 \neq 0 \Rightarrow (u+1)(u+1) \neq 0 \Rightarrow u \neq -1 \quad u \neq -1$ $\Rightarrow u+1 \neq 0 \Rightarrow u \neq -1 \text{ و } u-1 \neq 0 \Rightarrow u \neq 1 \Rightarrow D_f = \mathbb{R} - \{-1, 1\}$ $\Rightarrow u^2-2u+2=0 \Rightarrow n=2 \Rightarrow u^2-4u+4=0 \Rightarrow (u-2)^2=0 \Rightarrow u=2$ ضرایب $u=2$ دارای یک ریشه ی مضاعف می باشد	8
$y = \int_{u+1}^{\frac{1}{u}} \Rightarrow u+1 > 0 \Rightarrow u > -1 \quad u+1 \neq 1 \Rightarrow u \neq 0$ $\Rightarrow \int_{u+1}^{\frac{1}{u}} \Rightarrow u > 0 \quad u \neq 1 \Rightarrow \int_{u+1}^{\frac{1}{u}} > 0 \Rightarrow 0 < u < 1$ $\Rightarrow D_f = (0, 1) \checkmark$	9
$D_{f(u)} = [-2, 3] \Rightarrow f(3u^2-1) \Rightarrow -2 \leq u \leq 3 \Rightarrow -2 \leq 3u^2-1 \leq 3 \Rightarrow 3u^2-1 \leq 3$ $\Rightarrow 3u^2 \leq 4 \Rightarrow u^2 \leq \frac{4}{3} \Rightarrow -\frac{2}{\sqrt{3}} \leq u \leq \frac{2}{\sqrt{3}} \Rightarrow D_{f(3u^2-1)} = [-\frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}}] \checkmark$	10