

الف) $y^3 - 9 = 2\alpha^3 \rightarrow y^3 = 2\alpha^3 + 9$
 $y_1^3 = 2\alpha^3 + 9$
 $y_2^3 = 2\alpha^3 + 9$ } $\Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ ✓

ب) $|y| + \alpha^2 = m + 3 \Rightarrow |y| = -\alpha^2 + m + 3 \xrightarrow{m=0} |y| = 3 \Rightarrow y = \pm 3$ X

ج) $\sqrt{\alpha-2} + |y-2| = 0 \xrightarrow{\text{موردصله مثبت}} \sqrt{\alpha-2} = 0 \Rightarrow \alpha = 2$
 $|y-2| = 0 \Rightarrow y = 2$ ✓

د) $\alpha = \cos y \xrightarrow{m=0} \cos y = 0 \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}$ X

الف) $y = \frac{\alpha+2}{\alpha^2-2\alpha} \rightarrow D_f = \mathbb{R}$

ب) $y = \frac{\alpha+2}{\alpha^2-2\alpha+1} \rightarrow D_f = \mathbb{R}$

ج) $y = \frac{\alpha+2}{\alpha^2+2\alpha+2} \rightarrow D_f = \mathbb{R}$

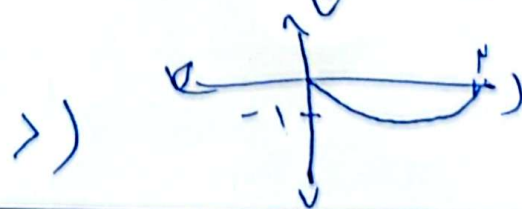
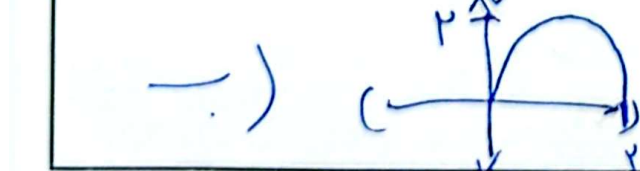
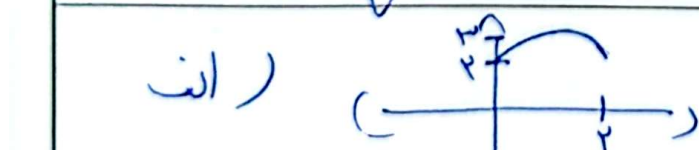
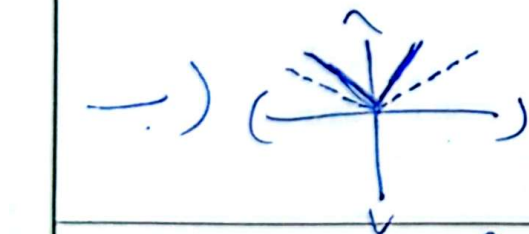
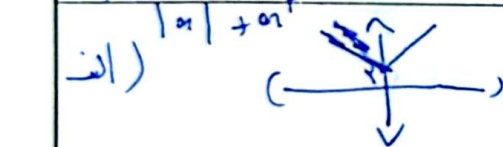
د) $\frac{\alpha+2}{\alpha^2-2\alpha} \rightarrow \frac{\alpha+2}{\alpha^2(\alpha-2)(\alpha+2)} \rightarrow D_f = \mathbb{R} - \{0, 2, -2\}$

الف) $\sqrt{2-\alpha} + \sqrt{\alpha-2} = y \Rightarrow y - \alpha > 0, \alpha - 2 > 0$
 $y > \alpha, \alpha > 2 \rightarrow D_f = [2, 4]$

ب) $y = \frac{2\alpha+1}{\alpha^2+2} \rightarrow D_f = \mathbb{R}$

ج) $\frac{\sqrt{\alpha-2}}{\alpha-2} \Rightarrow \alpha-2 > 0, \alpha-2 \neq 0 \Rightarrow \alpha \neq 2, \alpha > 2 \Rightarrow D_f = [2, \infty) \cup (2, +\infty)$

د) $\frac{2\alpha+2}{|\alpha|+\alpha^2} \Rightarrow |\alpha|+\alpha^2 \neq 0 \Rightarrow \alpha \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$



$$\text{الف) } y = (x-2)(x-3)(x-4)$$

$$\begin{array}{c} 2 \quad 3 \quad 4 \\ \hline - \phi + \phi - \phi + \end{array}$$

$$\text{ب) } (x-2)(x-3)^2(x-4) = y$$

$$\begin{array}{c} 2 \quad 3^* \quad 4 \\ \hline + \phi - \phi - \phi + \end{array}$$

$$\text{الف) } y = \frac{(x-2)(x-4)}{x-3}$$

$$\begin{array}{c} 2 \quad 3 \quad 4 \\ \hline - \phi + \phi - \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$$\text{ب) } \frac{(x-2)(x-4)}{(x-3)^2}$$

$$\begin{array}{c} 2 \quad 3^* \quad 4 \\ \hline + \phi - \phi - \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$$\text{الف) } \frac{x^3 - 3x + 2}{x-3} = y \Rightarrow \frac{(x-1)(x+2)(x-1)}{x-3}$$

$$\begin{array}{c} -2 \quad 1^* \quad 3 \\ \hline + \phi - \phi - \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$$\text{ب) } y = \frac{x^3 - 3x + 2}{x^2 - 4x + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)} \quad 1, 2$$

$$\begin{array}{c} 1^* \quad 2 \quad 3 \\ \hline + \phi + \phi - \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$$\text{الف) } y = \frac{x^4 - x^2}{x^2 + x + 2} \rightarrow 1, -1, 0$$

$$\begin{array}{c} -1 \quad 0 \quad 1 \\ \hline - \phi + \phi - \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$$\text{ب) } y = \frac{x^4 + 2x + 2}{x^2 + 2x + 2} \rightarrow \text{با اعداد صحیح مقادیر}$$

$$\text{الف) } y = \sqrt{\frac{x^3 - 1}{x^3 - x}} \Rightarrow \begin{array}{l} x^3 - 1 \geq 0 \Rightarrow x^3 \geq 1 \Rightarrow x \geq 1 \\ x^3 - x \neq 0 \Rightarrow x \neq 0, 1, -1 \end{array}$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 1}{x^2 - 2x + 4}} = \sqrt{\frac{(x+1)(x-1)}{(x-1)(x-4)}} \rightarrow \frac{x+1}{x-4}$$

$$\begin{array}{c} -1 \quad 0 \quad 1^* \quad 4 \\ \hline + \phi - \phi + \phi + \\ 0 \quad 0 \quad 0 \end{array}$$

$(-\infty, -1) \cup (0, 1) \cup (1, 4) \cup (4, +\infty)$
 $(-\infty, -1] \cup (1, 4)$
 $\cup (4, +\infty)$

$$\begin{array}{c} -1 \quad 0 \quad 1^* \quad 4 \\ \hline + \phi - \phi + \phi + \\ 0 \quad 0 \quad 0 \end{array}$$