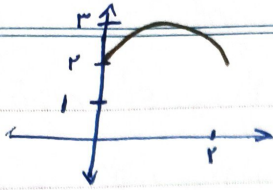
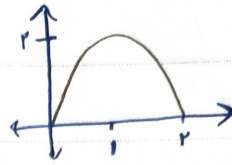


الف)



ب)

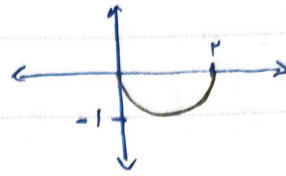


①

ج)



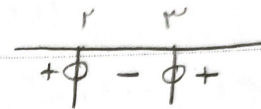
د)



②

الف) $x^2 - 4x + 4 > 0$

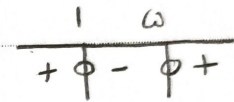
$(x-2)(x-2) > 0$



$(-\infty, 2) \cup (2, +\infty)$

ب) $x^2 - 4x + 4 < 0$

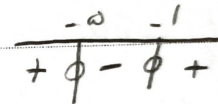
$(x-2)(x-2) < 0$



$(2, 2)$

ج) $x^2 + 4x + 4 \geq 0$

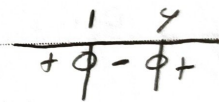
$(x+2)(x+2) \geq 0$



$(-\infty, -2] \cup [-2, +\infty)$

د) $x^2 - 4x + 4 \leq 0$

$(x-2)(x-2) \leq 0$

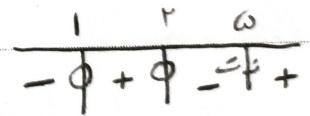


$[2, 2]$

③

الف) $\frac{x^2 - 3x + 2}{x - 5} < 0$

$\frac{(x-1)(x-2)}{x-5} < 0$



$(-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0$

$\frac{(x-1)(x+1)}{(x-2)(x-2)} \geq 0$



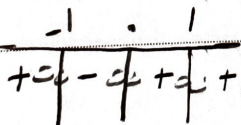
$(-\infty, -1] \cup (1, +\infty)$

④

الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}}$

$\frac{x^3 - 1}{x^3 - x} \geq 0$

$\frac{x^3 - 1}{x(x-1)(x+1)} \geq 0$



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

$$ب) y = \sqrt{\frac{x^2-16}{x^2-5x+4}} \quad \frac{x^2-16}{x^2-5x+4} \geq 0 \quad \frac{(x-4)(x+4)}{(x-1)(x-4)} \geq 0$$

$$\begin{array}{c} -4 \quad 1 \quad 4 \\ + \quad 0 \quad - \quad + \quad + \end{array} \quad (-\infty, -4] \cup (1, +\infty)$$

$$الف) y = \sqrt{4-\sqrt{2-x}} \quad \begin{array}{l} 2-x \geq 0 \rightarrow x \leq 2 \\ 4-\sqrt{2-x} \geq 0 \rightarrow 4-\sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 2-x \leq 16 \rightarrow x \geq -14 \end{array} \quad \left. \begin{array}{l} x \leq 2 \\ x \geq -14 \end{array} \right\} \rightarrow -14 \leq x \leq 2$$

$$ب) y = \sqrt{3-\sqrt{x-2}} \quad \begin{array}{l} x-2 \geq 0 \rightarrow x \geq 2 \\ 3-\sqrt{x-2} \geq 0 \rightarrow 3-\sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \end{array} \quad \left. \begin{array}{l} x \geq 2 \\ x \leq 11 \end{array} \right\} \rightarrow 2 \leq x \leq 11$$

$$الف) y = \sqrt{4-2x^2} \rightarrow 4-2x^2 \geq 0 \rightarrow 2(2-x^2) \geq 0 \quad 2-x^2 \geq 0 \rightarrow x^2 \leq 2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2} \rightarrow [-\sqrt{2}, \sqrt{2}]$$

$$ب) y = \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow \begin{array}{l} x \geq 3 \\ x \leq -3 \end{array} \rightarrow (-\infty, -3] \cup [3, +\infty)$$

$$الف) y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \rightarrow \begin{array}{l} |x|-3 \neq 0 \rightarrow |x| \neq 3 \\ x \neq 3, -3 \rightarrow \mathbb{R} - \{3, -3\} \end{array}$$

$$ب) y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \quad \begin{array}{l} x \geq 0 \\ \sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \end{array} \quad [0, +\infty) - \{9\}$$

الف) $y = \frac{\sin x}{r \cos x - 1}$

$r \cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{r}$

$R = \{ 2k\pi \pm \frac{\pi}{r} \}$



(A)

ب) $y = \frac{\cos x + 1}{r \sin x + 1}$

$r \sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{r}$

$R = \{ 2k\pi - \frac{\pi}{r}, 2k\pi + \frac{\pi}{r} \}$



ج) $y = \frac{\tan x + 1}{\cot x - 1}$

$\cos x \neq 0, \sin x \neq 0$

$\cot x \neq 1 \rightarrow \frac{\cos x}{\sin x} \neq 1$

$R = \{ \frac{k\pi}{r}, k\pi + \frac{\pi}{r} \}$



د) $y = \frac{\sin^2 x}{r \sin^2 x - r}$

$r \sin^2 x - r \neq 0 \rightarrow \sin^2 x \neq \frac{r}{r}$

$R = \{ 2k\pi + \frac{\pi}{r}, 2k\pi + \frac{\pi}{r} \}$



$y = \frac{1}{\sqrt{r|x-r| - \frac{1}{r}}}$ $\rightarrow r|x-r| - \frac{1}{r} > 0$

$|x-r| > \frac{1}{r}$

$x-r > \frac{1}{r} \rightarrow x > \frac{r+1}{r}$

$x-r < -\frac{1}{r} \rightarrow x < \frac{r-1}{r}$

$\rightarrow (-\infty, \frac{r-1}{r}) \cup (\frac{r+1}{r}, +\infty)$

(9)

الف) $y = \sqrt{4 - 2|x|}$

$4 - 2|x| \geq 0 \rightarrow 2 - |x| \geq 0$

$\rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2 \rightarrow [-2, 2]$

ب) $\sqrt{\frac{|x|}{|x|}}$

$\frac{|x|}{|x|} \geq 0 \rightarrow \frac{|x|}{|x|} \geq 0 \rightarrow x \neq 0$

$\rightarrow R = \{0\} \cup (-\infty, 0) \cup (0, +\infty)$

(L)