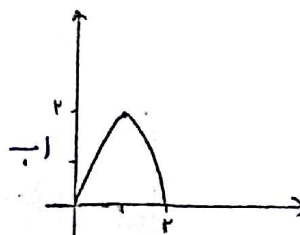
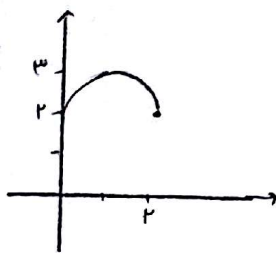
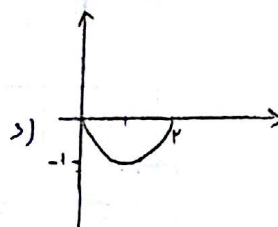
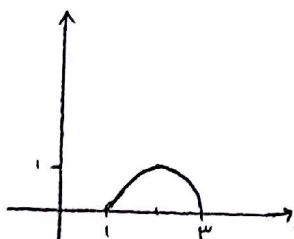


۱.

الف)

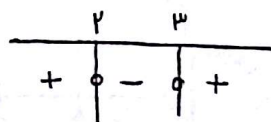


ب)



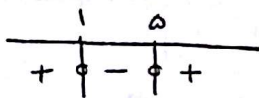
۲.

الف) $(x-2)(x-3) > 0$
 $\begin{matrix} 2 & 3 \end{matrix}$



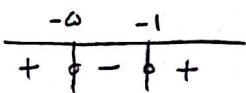
$$D_f = (-\infty, 2) \cup (3, +\infty) \subseteq \mathbb{R} - [2, 3]$$

ب) $(x-1)(x-5) < 0$
 $\begin{matrix} 1 & 5 \end{matrix}$



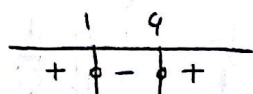
$$D_f = (1, 5)$$

ج) $(x+1)(x+5) \gg 0$
 $\begin{matrix} -1 & -5 \end{matrix}$



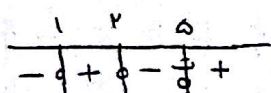
$$D_f = (-\infty, -5] \cup [-1, +\infty) \subseteq \mathbb{R} - (-5, -1)$$

د) $(x-1)(x-4) \leq 0$
 $\begin{matrix} 1 & 4 \end{matrix}$



$$D_f = [1, 4]$$

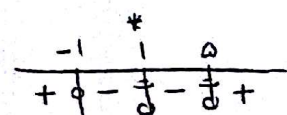
الف) $\frac{(x-1)(x-2)}{x-5} < 0$
 $\begin{matrix} 1 & 2 & 5 \end{matrix}$



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

۳.

ب) $\frac{(x-1)(x+1)}{(x-1)(x-5)} \gg 0$
 $\begin{matrix} 1 & -1 & 5 \end{matrix}$



$$D_f = (-\infty, -1] \cup (5, +\infty)$$

الف) $\frac{(x-1)(x^2+x+1)}{x(x^2-1)} \gg 0$ $\Delta < 0$

$$\frac{-1 \quad 0 \quad +1}{+ \quad - \quad +}$$

$$D_f = (-\infty, -1) \cup (0, +\infty) - \{1\}$$

الف) $\frac{(x-4)(x+4)}{(x-1)(x-4)} \gg 0$

$$\frac{-4 \quad 1 \quad 4}{+ \quad - \quad +}$$

$$D_f = (-\infty, -4] \cup (1, +\infty) - \{4\}$$

الف) $2-x \gg 0 \rightarrow x < 2$

$4 - \sqrt{2-x} \gg 0 \rightarrow \sqrt{2-x} < 4 \rightarrow 2-x < 16 \rightarrow x > -14$

$$D_f = -14 < x < 2 \rightarrow [-14, 2]$$

الف) $x-2 \gg 0 \rightarrow x > 2$

$3 - \sqrt{x-2} \gg 0 \rightarrow \sqrt{x-2} < 3 \rightarrow x-2 < 9 \rightarrow x < 11$

$$D_f = 2 < x < 11 \rightarrow [2, 11]$$

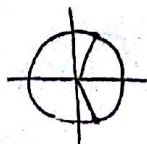
الف) $4 - 2x^2 \gg 0 \rightarrow 2x^2 < 4 \rightarrow x^2 < 2 \rightarrow -\sqrt{2} < x < \sqrt{2} \rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$

الف) $3|x|-9 \gg 0 \rightarrow 3|x| > 9 \rightarrow |x| > 3 \rightarrow \begin{cases} x > 3 \\ x < -3 \end{cases} \rightarrow D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $|x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x \neq \pm 3 \rightarrow D_f = \mathbb{R} - \{\pm 3\}$

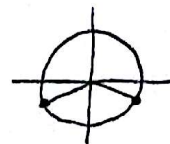
الف) $\sqrt{x} - 3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \rightarrow D_f = [0, +\infty) - \{9\}$
 $x \gg 0$

الف) $2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$



$$D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{3} \right\}$$

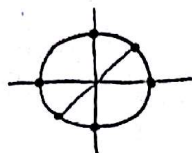
→) $r \sin x + 1 \neq 0 \rightarrow r \sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{r}$



$D_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{4}, k\pi - \frac{5\pi}{4} \right\}$

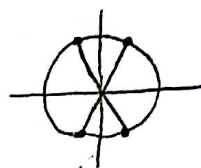
2) $\cos x \neq 0$

$\sin x \neq 0, \cot x \neq 1$



$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi + \frac{\pi}{2} \right\}$

3) $r \sin^2 x - 3 \neq 0 \rightarrow r \sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{r} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{r}$



$D_f = \mathbb{R} - \left\{ k\pi \pm \frac{\pi}{r} \right\}$

$r|x-2| - \frac{1}{r} > 0 \rightarrow r|x-2| > \frac{1}{r} \rightarrow |x-2| > \frac{1}{r} \rightarrow x-2 > \frac{1}{r} \rightarrow x > 2 + \frac{1}{r}$
 $\searrow x-2 < -\frac{1}{r} \rightarrow x < 2 - \frac{1}{r}$

$D_f = (-\infty, \frac{4}{r}) \cup (\frac{4}{r}, +\infty)$

4) $r - 2|x| > 0 \rightarrow 2|x| < r \rightarrow |x| < \frac{r}{2} \rightarrow -\frac{r}{2} < x < \frac{r}{2} \rightarrow D_f = \left(-\frac{r}{2}, \frac{r}{2}\right)$

→) $\frac{|x|}{|x|} > 0 \rightarrow$ جميع بقدر

$\rightarrow D_f = \mathbb{R} - \{0\}$

$|x| \neq 0 \rightarrow x \neq 0$