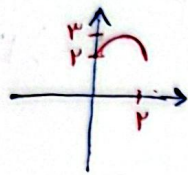
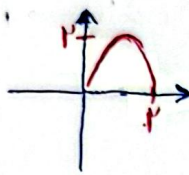


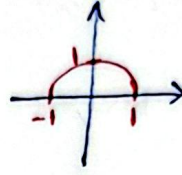
الف) $f(x)+2$



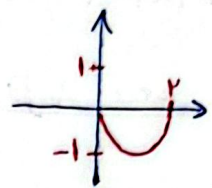
ب) $2f(x)$



ج) $f(x-1)$



د) $-f(x)$



(دو واحد به بالا)

(مقدارهای y برابر می شوند.)

(او واحد به راست)

(قرینه نسبت به محور x ها)

الف) $x^2-5x+6 > 0 \rightarrow (x-2)(x-3) > 0$

ریشه ها: ۲ ۳

$\frac{x}{y} \begin{array}{c|cc} 2 & 3 \\ \hline + & - & + \end{array} \rightarrow (-\infty, 2) \cup (3, +\infty)$

ب) $x^2-6x+5 < 0 \rightarrow (x-1)(x-5) < 0$

ریشه ها: ۱ ۵

$\frac{x}{y} \begin{array}{c|cc} 1 & 5 \\ \hline + & - & + \end{array} \rightarrow (1, 5)$

ج) $x^2+6x+5 \geq 0 \rightarrow (x+1)(x+5) \geq 0$

ریشه ها: -۱ -۵

$\frac{x}{y} \begin{array}{c|cc} -5 & -1 \\ \hline + & - & + \end{array} \rightarrow (-\infty, -5] \cup [-1, +\infty)$

د) $x^2-7x+6 \leq 0 \rightarrow (x-1)(x-6) \leq 0$

ریشه ها: ۱ ۶
 $\frac{x}{y} \begin{array}{c|cc} 1 & 6 \\ \hline + & - & + \end{array} \rightarrow [1, 6]$

الف) $\frac{x^2-3x+2}{x-5} < 0$

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

$\frac{x}{y} \begin{array}{c|ccc} 1 & 2 & 5 \\ \hline - & + & - & + \end{array} \rightarrow (-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2-1}{x^2-6x+5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)}$

$\frac{x}{y} \begin{array}{c|ccc} 1 & 5 \\ \hline + & - & - & + \end{array} \rightarrow (-\infty, -1] \cup (5, +\infty)$

الف) $y = \sqrt{\frac{x^3-1}{x^3-x}} \rightarrow \frac{x^3-1}{x(x^2-1)}$

$\frac{x}{y} \begin{array}{c|ccc} 1 & 0 & 1 \\ \hline + & - & - & + \end{array} \rightarrow D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

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

$\frac{x}{y} \begin{array}{c|ccc} -4 & 1 & 4 \\ \hline + & - & - & + \end{array} \rightarrow D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

الف) $y = \sqrt{4-\sqrt{2-x}}$

$\rightarrow 2-x \geq 0 \rightarrow x \leq 2$

$\rightarrow 4-\sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 2-x \leq 16 \rightarrow x \geq -14$

$\rightarrow (x \geq -14) \cap (x \leq 2) = [-14, 2] \rightarrow D_f = [-14, 2]$

ب) $y = \sqrt{3-\sqrt{x-2}}$

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

$\rightarrow 3-\sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11$

$\rightarrow (x \geq 2) \cap (x \leq 11) = [2, 11] \rightarrow D_f = [2, 11]$

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

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

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$ فقط مغنی نباید صفر شود $|x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow \begin{matrix} x \neq -3 \\ x \neq 3 \end{matrix}$

$\rightarrow D_f = \mathbb{R} - \{3, -3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ $\begin{matrix} x \geq 0 \\ \sqrt{x}-3 \neq 0 \end{matrix} \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \rightarrow D_f = [0 \ 9) \cup (9 +\infty)$

الف) $y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$ 
 $\rightarrow D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$

ب) $y = \frac{\cos x + 1}{2\sin x + 1} \rightarrow 2\sin x + 1 \neq 0 \rightarrow 2\sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{2}$ 
 $\rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\}$

ج) $y = \frac{\tan x + 2}{\cot x - 1} = \frac{\frac{\sin x}{\cos x} + 2}{\frac{\cos x}{\sin x} - 1} \rightarrow \begin{matrix} \cos \neq 0 \\ \sin \neq 0 \end{matrix}$ 
 $\rightarrow \cot x - 1 \neq 0 \rightarrow \cot x \neq 1$

د) $y = \frac{\sin x + 1}{5\sin^2 x - 3} \rightarrow 5\sin^2 x - 3 \neq 0 \rightarrow 5\sin^2 x \neq 3$ $\rightarrow D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{5}, k\pi + \frac{4\pi}{5}\}$

$\rightarrow \sin^2 x \neq \frac{3}{5} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{\sqrt{5}}$ 
 $\rightarrow D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{5}\}$

$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{F}}}$ $2|x-2| > \frac{1}{F} \rightarrow |x-2| > \frac{1}{2F} \rightarrow \begin{matrix} x-2 > \frac{1}{2F} \rightarrow x > \frac{q}{F} \\ x-2 < -\frac{1}{2F} \rightarrow x < \frac{v}{F} \end{matrix}$
 $\rightarrow D_f = (-\infty \frac{v}{F}) \cup (\frac{q}{F} +\infty)$

الف) $y = \sqrt{4-2|x|} \rightarrow 4-2|x| \geq 0 \rightarrow 2|x| \leq 4 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$
 $\rightarrow D_f = [-2 \ 2]$

ب) $y = \frac{\sqrt{|x|}}{|x|}$ فقط مغنی نباید صفر باشد $|x| \neq 0 \rightarrow x \neq 0$

$\rightarrow D_f = \mathbb{R} - \{0\} \subseteq D_f = (-\infty 0) \cup (0 +\infty)$