

الف) $y^3 - x = 2x^2 \xrightarrow{x=0} y = \sqrt[3]{2x^2}$ (تابع هست)

ب) $|y| + x^2 = x + 3 \xrightarrow{x=0} \begin{cases} y = -3 \\ y = 3 \end{cases}$ (تابع نیست)

ج) $\sqrt{x-4} + |y-2| = 0 \xrightarrow{x=0} y = 2$ (تابع هست)

د) $x = \cos y \xrightarrow{x=0} \cos y = 0 \begin{cases} y = 90^\circ \\ y = 270^\circ \end{cases}$ (تابع نیست)

الف) $y = \frac{x+4}{x^2-4x} = \frac{x+4}{x(x-4)}$ $D_f: (-\infty, 0) \cup (0, 4) \cup (4, +\infty)$

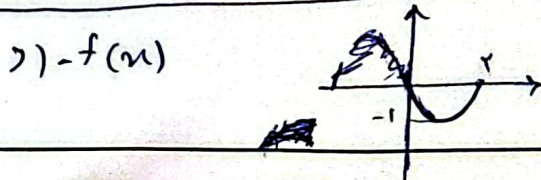
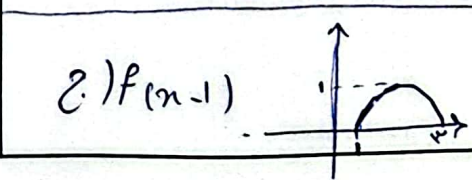
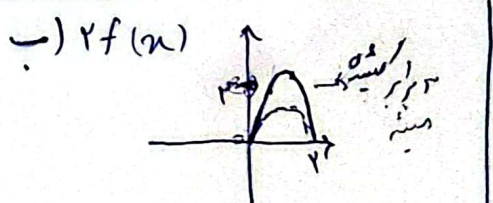
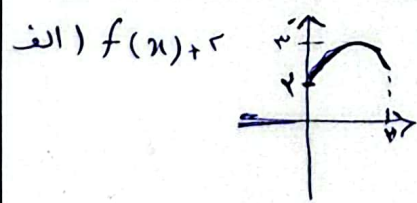
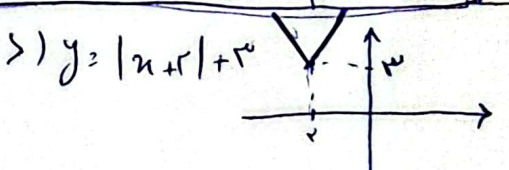
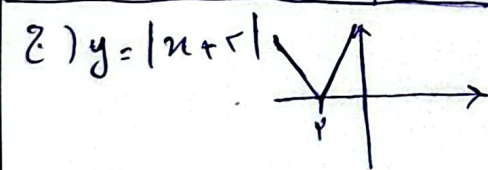
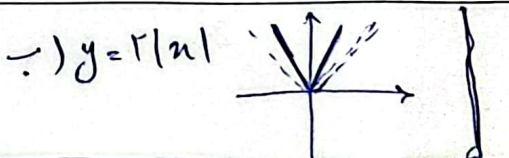
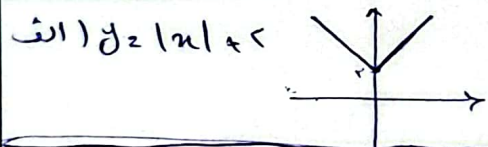
ب) $y = \frac{x+4}{x^2-7x+12} = \frac{x+4}{(x-3)(x-4)}$ $D_f: \mathbb{R}$ ج) $\frac{x+4}{x^2+x+4} = y \rightarrow D_f: \mathbb{R}$

د) $\frac{x+4}{(x^2-7x)(x^2-2x)} = \frac{x+4}{x^2(x-7)(x-2)}$ $D_f: (-\infty, -2) \cup (-2, 0) \cup (0, 2) \cup (2, +\infty)$

الف) $y = \sqrt{4-x} + \sqrt{x-2} = \begin{cases} x \leq 4 \\ x \geq 2 \end{cases}$ $D_f: 2 \leq x \leq 4$

ب) $\frac{3x+1}{x^2+1} = \frac{3x+1}{x^2+1}$ $D_f: x \neq -\frac{1}{3}$ ج) $\frac{\sqrt{x-2}}{x-4} = \frac{\sqrt{x-2}}{x-4}$ $D_f: x > 4$

د) $\frac{3}{x^2+1} = \frac{3}{x^2+1}$ $D_f: (0, +\infty) \cup (-\infty, 0)$



الف) $y = \underbrace{(x-2)}_2 \underbrace{(x-3)}_3 \underbrace{(x-4)}_4$	$\begin{array}{c ccc} & 2 & 3 & 4 \\ \hline & - & + & - & + \end{array}$	
ب) $y = \underbrace{(x-2)}_2 \underbrace{(x-3)^2}_{(x-3)(x-3)} \underbrace{(x-4)}_4$	$\begin{array}{c ccc} & 2 & 3 & 4 \\ \hline & + & - & - & + \end{array}$	۶
الف) $y = \frac{(x-2)(x-4)}{x-3}$	$\begin{array}{c ccc} & 2 & 3 & 4 \\ \hline & - & + & - & + \end{array}$	
ب) $y = \frac{(x-2)(x-4)}{(x-3)(x-3)}$	$\begin{array}{c ccc} & 2 & 3 & 4 \\ \hline & + & - & - & + \end{array}$	۷
الف) $y = \frac{x^2 - 3x + 2}{x-3}$ ؟		
ب) $y = \frac{x^2 - 3x + 2}{x^2 - 4x + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$	$\begin{array}{c ccc} & 1 & 2 & 3 \\ \hline & + & + & - & + \end{array}$	۸
الف) $y = \frac{x^2 - 2x}{x^2 + x + 2} = \frac{x^2(x-2)}{x(x+1)+2}$	$\begin{array}{c cc} & 0 & 1 \\ \hline & + & - & + \end{array}$	
ب) $y = \frac{x^2 + 3x + 4}{x^2 + 2x + 3}$	$\frac{x(x+3)+4}{x(x+2)+3}$	۹
الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - x}}$	$(-\infty, -1) \cup (0, \infty) : D_f$	
ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}}$	$D_f: (-\infty, -4] \cup (1, 4) \cup (4, \infty)$	۱۰