

$$- y^2 - x = 2x^2 \rightarrow \begin{cases} y^2 = 2x^2 + x \\ y^2 = 2x^2 + x \end{cases} \rightarrow y_1 = y_2 \Rightarrow y_1 = y_2 \rightarrow \checkmark$$

$$- |y| + x^2 = x + 3 \xrightarrow{x=1} |y| + 1 = 1 + 3 \rightarrow y = \pm 3 \rightarrow X$$

$$- \sqrt{x-4} + |y-2| = 0 \rightarrow \begin{cases} \sqrt{x-4} = 0 \rightarrow x=4 \\ |y-2| = 0 \rightarrow y=2 \end{cases} \Rightarrow \text{نقطه} \rightarrow \checkmark$$

$$- x = \cos y \xrightarrow{x=\frac{1}{2}} \frac{1}{2} = \cos y \rightarrow y = \frac{\pi}{3} \text{ یا } y = \frac{5\pi}{3}$$

$$\text{الف) } y = \frac{x+4}{x^2-4x} \rightarrow x^2-4x \neq 0 \rightarrow x(x-4) \neq 0 \rightarrow x \neq 0 \text{ و } x \neq 4 \rightarrow D_f = \mathbb{R} - \{0, 4\}$$

$$\text{ب) } y = \frac{x+4}{x^2-4x+4} \rightarrow \Delta = b^2 - 4ac = 16 - 16 = 0 \rightarrow \text{ریشه تکراری} \rightarrow D_f = \mathbb{R}$$

$$\text{ج) } y = \frac{x+4}{x^2+x+4} \rightarrow \Delta = b^2 - 4ac = 1 - 16 = -15 \rightarrow \text{ریشه ندارد} \rightarrow D_f = \mathbb{R}$$

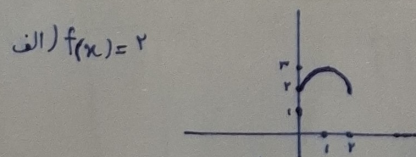
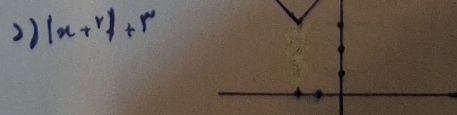
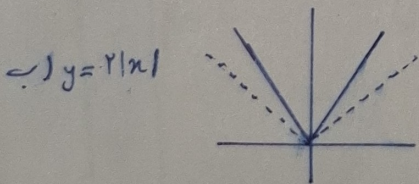
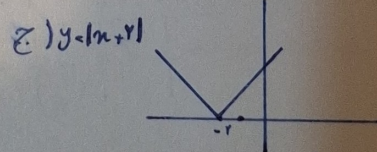
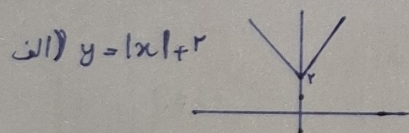
$$\text{د) } y = \frac{x+4}{x^2-4x^2} = \frac{x+4}{x^2(x-4)} \rightarrow D_f = \mathbb{R} - \{0, 4\}$$

$$\text{الف) } y = \sqrt{4-x} + \sqrt{x-2} \rightarrow \begin{cases} 4-x \geq 0 \rightarrow x \leq 4 \\ x-2 \geq 0 \rightarrow x \geq 2 \end{cases} \rightarrow 2 \leq x \leq 4 \rightarrow [2, 4]$$

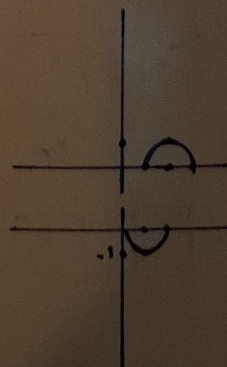
$$\text{ب) } y = \frac{x+1}{x^2+1} \rightarrow x^2 \neq -1 \rightarrow D_f = \mathbb{R}$$

$$\text{ج) } y = \frac{\sqrt{x-2}}{x-4} \rightarrow \begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \\ x-4 \neq 0 \rightarrow x \neq 4 \end{cases} \rightarrow D_f = [2, +\infty) - \{4\}$$

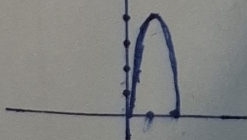
$$\text{د) } \frac{x+3}{|x|+x^2} \rightarrow D_f = \mathbb{R} - \{0\}$$



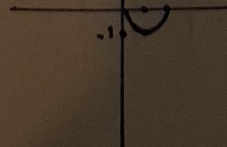
ج) $f(x-1)$



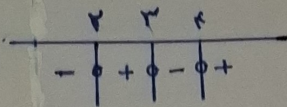
ب) $2f(x)$



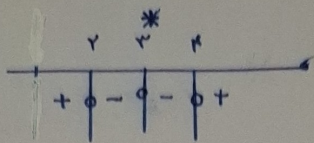
د) $-f(x)$



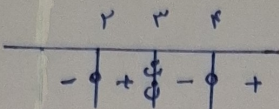
الف) $y = (x-2)(x-3)(x-4)$



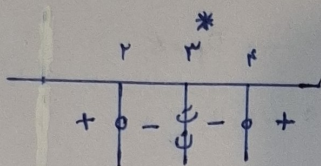
ب) $y = (x-2)(x-3)(x-4)$



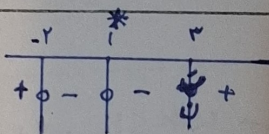
الف) $y = \frac{(x-2)(x-4)}{x-3}$



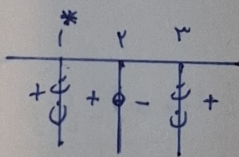
ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$



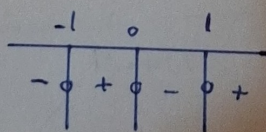
الف) $y = \frac{x^2-3x+2}{x-3} = \frac{(x-1)^2(x+2)}{x-3}$



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



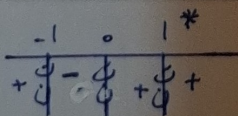
الف) $y = \frac{x^2-x}{x^2+x+2} = \frac{x^2(x+1)(x-1)}{x^2+x+2}$



ب) $y = \frac{x^2+3x+2}{x^2+2x+3} \Rightarrow$ قابل تجزیه نیست

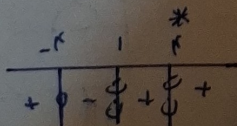
در هر صورت (+) می شود

الف) $\sqrt{\frac{x^2-1}{x^2-x}} = \sqrt{\frac{(x-1)(x+1)}{x(x-1)(x-1)}}$



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

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



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