

الف) $y^3 - x = 2x^2 \Rightarrow y^3 = 2x^2 + x \Rightarrow \begin{cases} y_1^3 = 2x^2 + x \Rightarrow y_1 = \sqrt[3]{2x^2 + x} \\ y_2^3 = 2x^2 + x \end{cases} \Rightarrow y_1 = y_2 \Rightarrow y_1 = \sqrt[3]{2x^2 + x} = y_2 \rightarrow$ تابع است

ب) $|y| + x^2 = x + 3 \Rightarrow |y| = x + 3 - x^2 \Rightarrow \begin{cases} |y_1| = x + 3 - x^2 \Rightarrow |y_1| = |x_2| \Rightarrow y_1 = \pm x_2 \\ |y_2| = x + 3 - x^2 \end{cases} \rightarrow$ تابع نیست

ج) $\sqrt{x^2} + |y-2| = 0 \xrightarrow{x=0} 0 + |y-2| = 0 \Rightarrow |y-2| = 0 \rightarrow y=2$ تعریف نشده \rightarrow تابع نیست

د) $x = \cos y \xrightarrow{x=0} \cos y = 0 \Rightarrow y = \pm \frac{\pi}{2}$ تابع نیست

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

ب) $y = \frac{x+4}{x^2-4x+16} \Rightarrow x^2-4x+16 \neq 0 \rightarrow$ همیشه زیاد $\rightarrow D_f = \mathbb{R}$

ج) $x = \frac{x+4}{x^2+x+4} \rightarrow x^2+x+4 \neq 0 \rightarrow$ همیشه زیاد $\rightarrow D_f = \mathbb{R}$

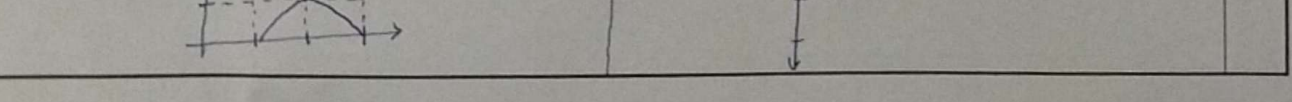
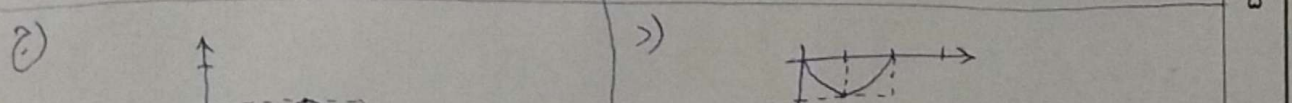
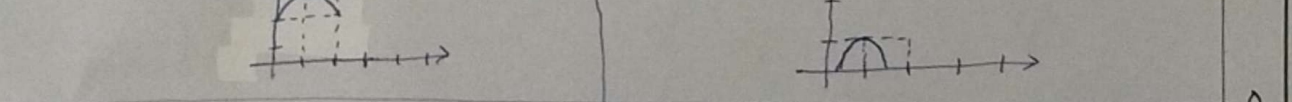
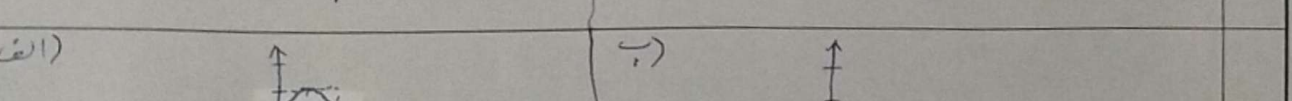
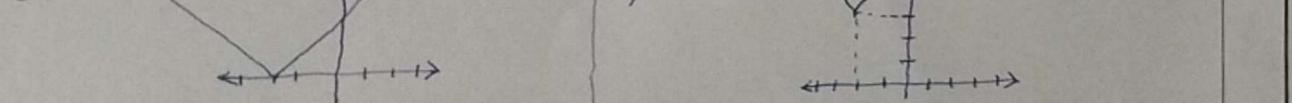
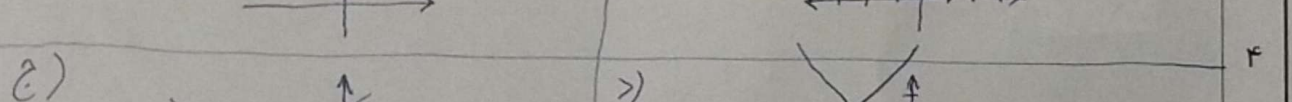
د) $y = \frac{x+4}{x^2-4x^2} \Rightarrow x^2-4x^2 \neq 0 \Rightarrow x^2(x^2-4) \neq 0 \Rightarrow x \neq 0, \pm 2 \rightarrow D_f = \mathbb{R} - \{0, 2, -2\}$

الف) $x = \sqrt{6-x} + \sqrt{x-2} \Rightarrow \sqrt{6-x} \geq 0 \Rightarrow 6-x \geq 0 \Rightarrow x \leq 6, \sqrt{x-2} \geq 0 \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2 \rightarrow D_f = [2, 6]$

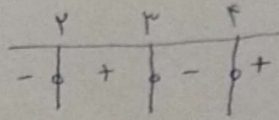
ب) $y = \frac{x^2+1}{x^2+1} \rightarrow x^2+1 \neq 0 \Rightarrow x^2 \neq -1 \rightarrow$ همیشه زیاد $\rightarrow D_f = \mathbb{R}$

ج) $x = \frac{\sqrt{x^2}}{x-4} \rightarrow \sqrt{x^2} \geq 0 \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2, x-4 \neq 0 \Rightarrow x \neq 4 \rightarrow D_f = [2, \infty) - \{4\}$

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

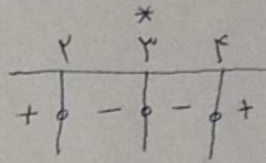


الف) $y = (x-2)(x-3)(x-4)$

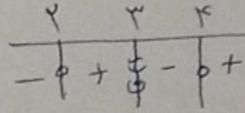


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ب) $y = (x-2)(x-3)^2(x-4)$

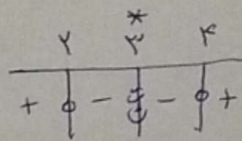


الف) $y = \frac{(x-2)(x-4)}{x^2}$

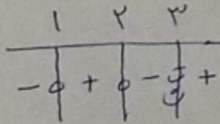


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ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$

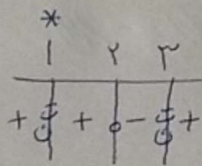


الف) $y = \frac{x^3 - 3x^2 + 2}{x-3}$

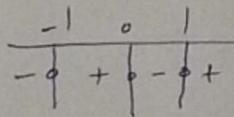


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ب) $y = \frac{x^2 - 3x + 2}{x^2 - 4x + 3}$

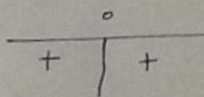


الف) $y = \frac{x^2 - x - 1}{x^2 + x + 2}$



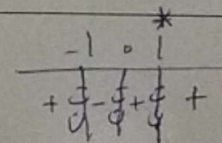
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ب) $y = \frac{x^2 + 3x + 4}{x^2 + 2x + 3}$



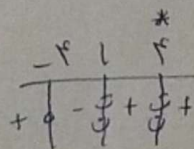
به انای نام تعادلیت است

الف) $y = \sqrt{\frac{x^3-1}{x^2-x}} \geq 0 \Rightarrow \frac{x^3-1}{x^2-x} \geq 0$



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

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



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