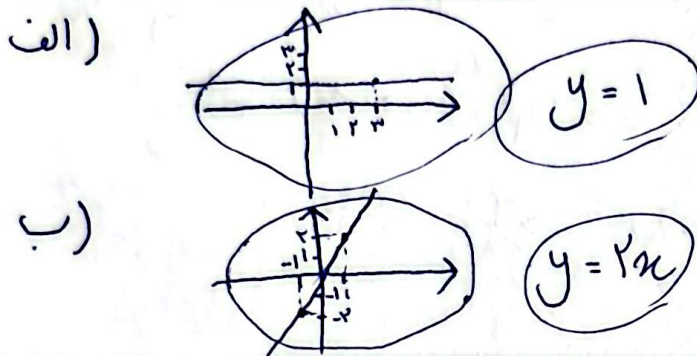


الف) $y^3 - x = 2x^2$ $y_1^3 - x_1 = 2x_1^2 \Rightarrow y_1^3 = 2x_1^2 + x_1$ $y_2^3 - x_2 = 2x_2^2 \Rightarrow y_2^3 = 2x_2^2 + x_2$ $\Rightarrow y_1 = y_2 \Rightarrow y_1 = y_2$ $\Rightarrow$ تابع است

ب) $|y| + x^2 = x + 3$ (مثال نقض) $\Rightarrow$ تابع نیست

ج) $\sqrt{x-4} + |y-2| = 0$ $\Rightarrow x=4, y=2$ $\Rightarrow$ یک نقطه است $\Rightarrow$ تابع است

د) $x = \cos y$ $\Rightarrow y = \{0, 2\pi, \dots\} \Rightarrow y = \{2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}\}$ $\Rightarrow$ تابع است

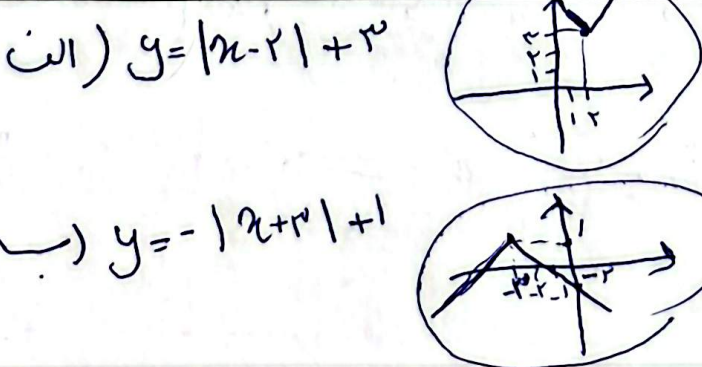
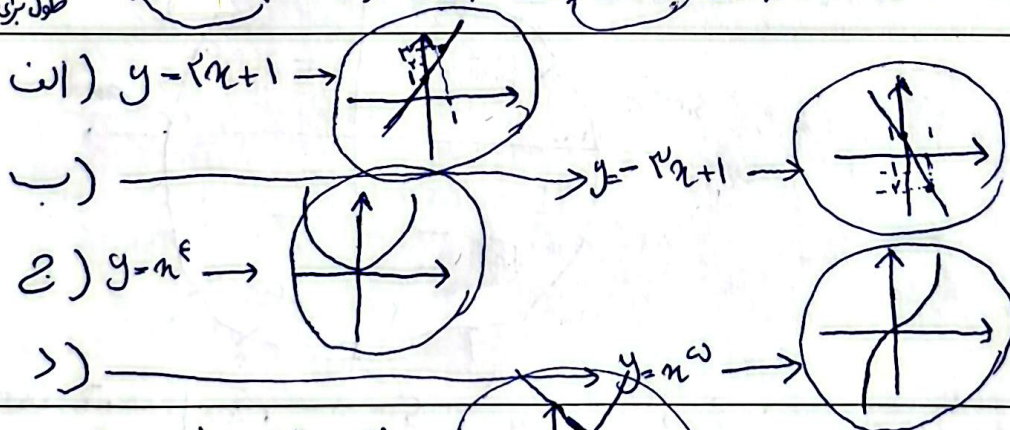


الف) $y = ax + b \Rightarrow$ تابع هانی باشد $\Rightarrow y = x \Rightarrow b=0, a=1$

$a+2b \Rightarrow 1+2x_0 = 1$

ب) $x^2 + ax + b \rightarrow \min | \cdot | \Rightarrow \frac{-a}{2} = 2 \Rightarrow a = -4$

$\{ -4(2) + b = 1 \Rightarrow b = 9 \Rightarrow a+2b = -4+18 = 14$



الف) $\frac{x+E}{x^2-Ex} \Rightarrow x^2-Ex \neq 0 \Rightarrow x(x-E) \neq 0 \Rightarrow x \neq \{0, E\} \Rightarrow D_f = \mathbb{R} - \{0, E\}$

ب) $\frac{x+E}{x^2-\sqrt{x+14}} \Rightarrow x^2-\sqrt{x+14} \neq 0 \Rightarrow \Delta = 49-4E < 0 \Rightarrow D_f = \mathbb{R}$

ج) $\frac{x+E}{x^2+x+E} \Rightarrow x^2+x+E \neq 0 \Rightarrow \Delta = 1-4E < 0 \Rightarrow D_f = \mathbb{R}$

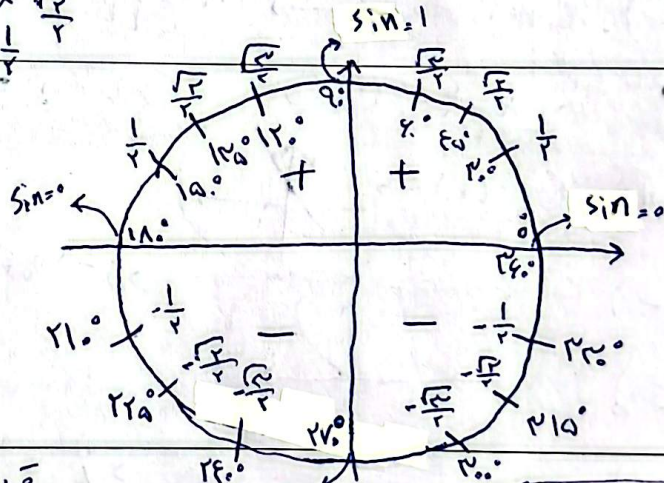
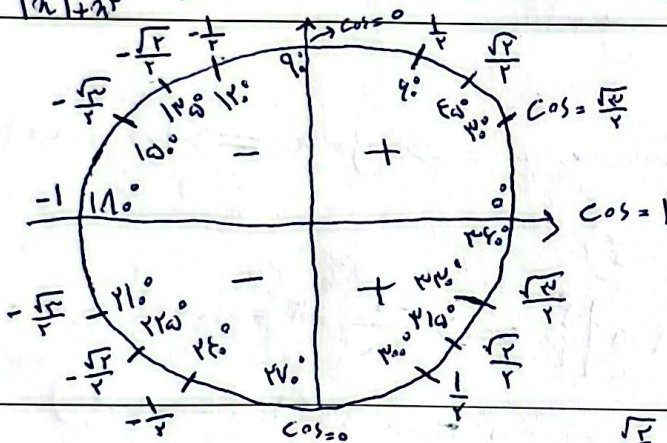
د) $\frac{x+E}{x^2-Ex^2} \Rightarrow x^2-Ex^2 \neq 0 \Rightarrow x^2(x^2-E) \neq 0 \Rightarrow x \neq \{0, \sqrt{E}, -\sqrt{E}\} \Rightarrow D_f = \mathbb{R} - \{0, \sqrt{E}, -\sqrt{E}\}$

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

ب) $y = \frac{x^2+1}{x^2+1} \Rightarrow x^2+1 \neq 0 \Rightarrow x^2+1 \rightarrow \text{همواره مثبت است} \Rightarrow D_f = \mathbb{R}$

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

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



الف) $\cos \frac{7\pi}{4} = \cos 150^\circ = -\frac{1}{2} \xrightarrow{\text{مربع}} \frac{1}{2} = \sin \alpha \Rightarrow \sin \alpha = 1 \Rightarrow \alpha = \left\{ 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{5\pi}{2} \right\}$

ب) $\cos \frac{11\pi}{4} = \cos 330^\circ = \frac{\sqrt{3}}{2} \xrightarrow{\text{مربع}} -\frac{\sqrt{3}}{2} = \sin \alpha \Rightarrow \alpha = \left\{ 2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2} \right\}$