

ا) $x^2 - \varepsilon x \neq 0 \Rightarrow x^2 - \varepsilon x = 0 \Rightarrow x(x - \varepsilon) \Rightarrow x = 0 \text{ or } x = \varepsilon \Rightarrow D_f = \mathbb{R} - \{0, \varepsilon\}$

ب) $x^2 - \sqrt{x+4} \neq 0 \Rightarrow \sqrt{x+4} \neq 0 \Rightarrow x+4 \geq 0 \Rightarrow x \geq -4 \Rightarrow D_f = \mathbb{R}$

ج) $x^2 + x + 1 \neq 0 \Rightarrow \Delta = 1 - 4 = -3 < 0 \Rightarrow x \in \mathbb{R} \Rightarrow D_f = \mathbb{R}$

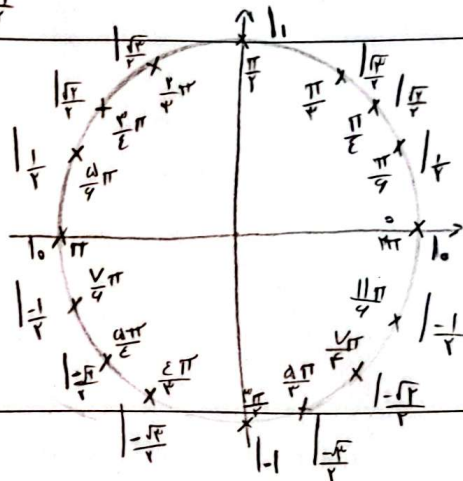
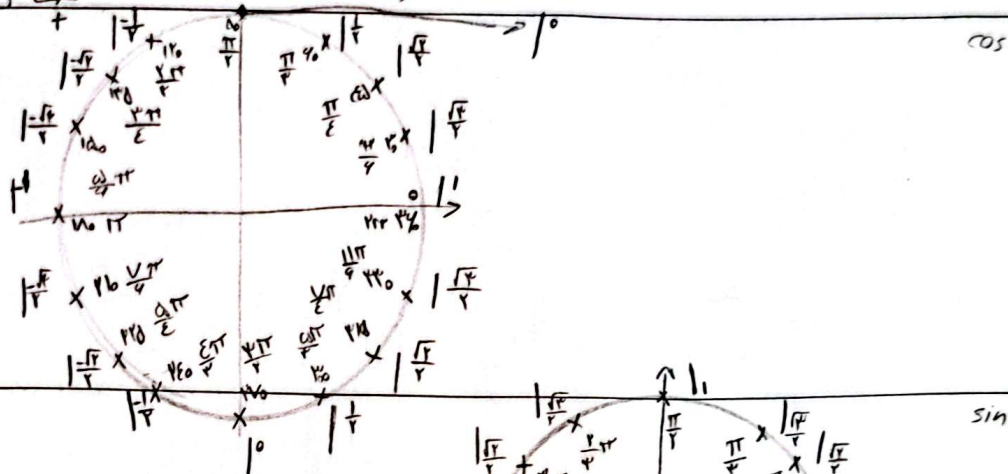
د) $x^2 - \varepsilon x^2 \neq 0 \Rightarrow x^2(x^2 - \varepsilon) \neq 0 \Rightarrow x^2 \neq 0 \text{ or } x^2 - \varepsilon \neq 0 \Rightarrow x \neq 0 \text{ or } x \neq \pm\sqrt{\varepsilon} \Rightarrow D_f = \mathbb{R} - \{0, \pm\sqrt{\varepsilon}\}$

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

ب) $\frac{x^2}{x+1} \neq 0 \Rightarrow D_f = \mathbb{R}$

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

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



ا) $-\cos 140^\circ = \frac{1}{\sqrt{2}} \Rightarrow \sin \frac{5\pi}{4}, \frac{3\pi}{4}$

ب) $-\cos 130^\circ = -\frac{\sqrt{2}}{2} \Rightarrow \sin \frac{4\pi}{5}, \frac{6\pi}{5}$

الف) $y_1'' = 12x' + 2x \Rightarrow y_1''' = y_2''' \Rightarrow y_1 = y_2 \checkmark$
 $y_2'' = 12x' + 2x$

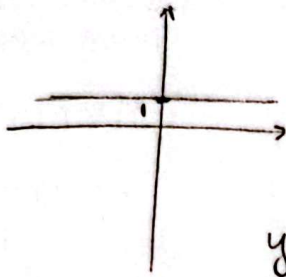
ب) $|y_1| = -x^2 + x + 3 \Rightarrow |y_1| = |y_2| \Rightarrow y_1 = \pm y_2 \times$

$|y_2| = -x^2 + x + 3$

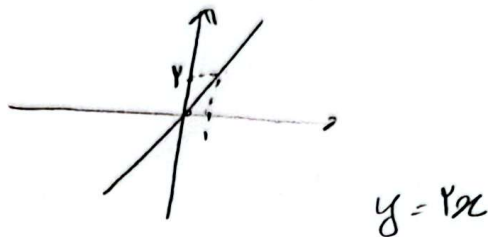
ج) $|x-2| + |y-2| = 0 \Rightarrow \begin{matrix} 0+0 \text{ در دو حالت} \\ 0+0 \text{ در دو حالت} \end{matrix} \Rightarrow \begin{matrix} 2 \\ 2 \end{matrix} \checkmark$

د) $x = \cos y \Rightarrow x = 1 \Rightarrow y = 0 \text{ و } y = 2\pi \dots (2k\pi) \times$

الف)



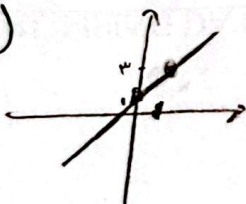
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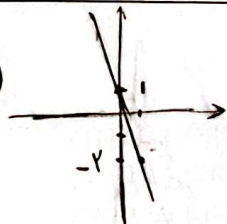
الف) $y = x \Rightarrow a = 1 \quad b = 0 \quad 1 + 0 = 1$

ب) $\min \begin{cases} r = \frac{-b}{2a} \\ 1 = \frac{-\Delta}{4a} \end{cases} \Rightarrow \frac{-a}{2} = 2 \quad \boxed{a = -4} \Rightarrow a + 2b = -4 + 0 = \boxed{-4}$
 $\Rightarrow \frac{-(14 - 4b)}{4} = 1 \Rightarrow 14 - 4b = -4 \Rightarrow -4b = -18 \Rightarrow \boxed{b = 4.5}$

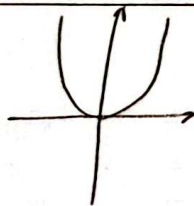
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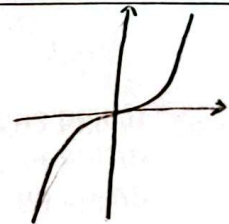
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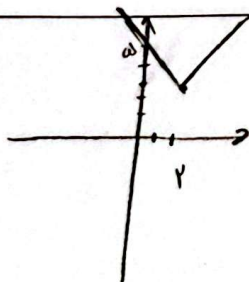
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