

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) $x^2 - \sqrt{x+4} \neq 0 \Rightarrow \sqrt{x+4} = \sqrt{4+4x} \Rightarrow \sqrt{x+4} = 2\sqrt{x+1} \Rightarrow \sqrt{x+4} = 2\sqrt{x+1} \Rightarrow D_f = \mathbb{R}$

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

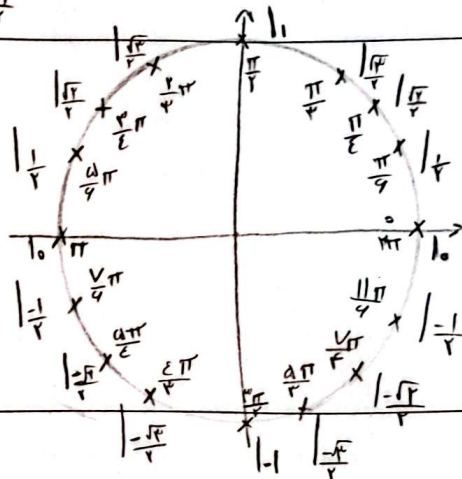
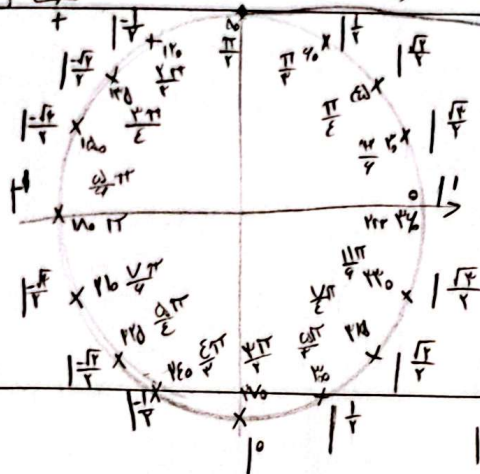
د) $x^2 - \varepsilon x^2 \neq 0 \Rightarrow x^2(x^2 - \varepsilon) \Rightarrow x^2(x^2 - \varepsilon) \Rightarrow D_f = \mathbb{R} - \{0, \pm \sqrt{\varepsilon}\}$

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) $-\cos 140^\circ = \frac{1}{4} \Rightarrow \sin \frac{11\pi}{9}, \frac{5\pi}{9}$

ب) $-\cos 130^\circ = -\frac{\sqrt{3}}{4} \Rightarrow \sin \frac{4\pi}{3}, \frac{2\pi}{3}$

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

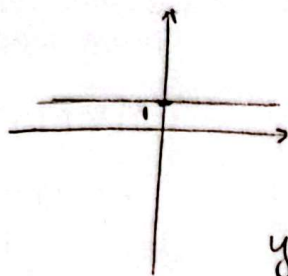
ب) $|y_1| = -x^2 + x + 3 \Rightarrow |y_1| = |y_2| \Rightarrow y_1 = \pm y_2 \times$

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

ج) $|x-2| + |y-2| = 0 \Rightarrow 0 + 0 = 0 \Rightarrow \begin{cases} x=2 \\ y=2 \end{cases} \checkmark$

د) $x = \cos y \Rightarrow x = 1 \Rightarrow y = 0 \Rightarrow y = 2\pi, \dots, (2k\pi) \times$

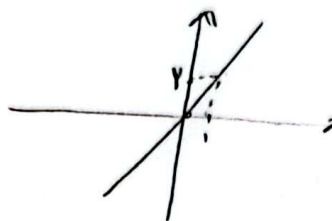
الف)



$y = 1$

۲) ✓

ب)



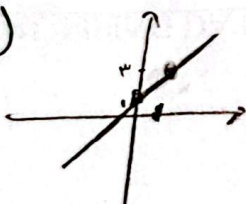
$y = 2x$

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

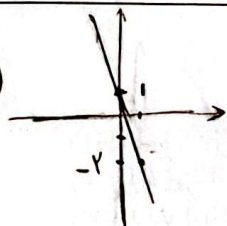
ب) $\min \left| r = \frac{-b}{\sqrt{a^2 + b^2}} \right| \Rightarrow \frac{-a}{\sqrt{a^2 + b^2}} = 2 \Rightarrow a = -4$
 $1 = \frac{-\Delta}{\sqrt{a^2 + b^2}} \Rightarrow \frac{-(14 - 4b)}{5} = 1 \Rightarrow 14 - 4b = -5 \Rightarrow -4b = -19 \Rightarrow b = \frac{19}{4}$
 $\Rightarrow a + 2b = -4 + 10 = 6$

۲) ✓

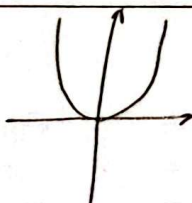
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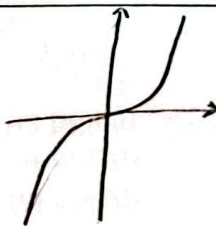
ب)



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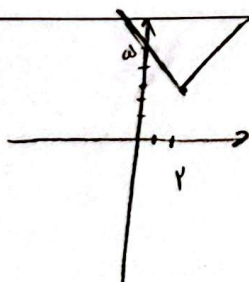


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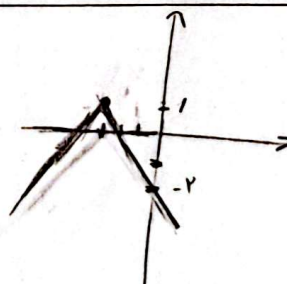


۲) ✓

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ب)



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