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نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۳ کلاس نشانی

الف) $y - x = 2x^2 \Rightarrow y^3 = 2x^2 + x \Rightarrow y^3 = x(2x + 1) \Rightarrow \begin{cases} y_1 = (2x+1)x \\ y_2 = (2x+1)x \\ y_3 = y_1 = y_2 \end{cases}$ تابع
ب) $|y| + x^2 = x + 3 \Rightarrow |y| = -x^2 + x + 3$ بازای $y = \pm 3 \leq x = 3$ تابع نیست

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ج) $\sqrt{x-4} + |y-2| = 0 \Rightarrow \begin{cases} |y-2| = -\sqrt{x-4} \\ |y-2| = -\sqrt{x-4} \end{cases} \Rightarrow y-2 = \pm(-\sqrt{x-4}) \Rightarrow \begin{cases} y_1 = 2 - \sqrt{x-4} \\ y_2 = 2 + \sqrt{x-4} \end{cases}$ تابع نیست

د) $x = \cos y \Rightarrow x = 0 \Rightarrow \cos y = 0 \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}$

الف) $y = \frac{x+4}{x^2-4x} = \frac{x+4}{x(x-4)} \Rightarrow x(x-4) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x \neq 4 \end{cases} \Rightarrow D = \mathbb{R} - \{0, 4\}$

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ب) $y = \frac{x+4}{x^2-4x+16} \Rightarrow x^2-4x+16 \neq 0 \Rightarrow \Delta = (-4)^2 - 4(16) = -60 \Rightarrow D = \mathbb{R}$

ج) $y = \frac{x+4}{x^2+x+4} \Rightarrow x^2+x+4 \neq 0 \Rightarrow \Delta = 1 - 16 = -15 \Rightarrow D = \mathbb{R}$

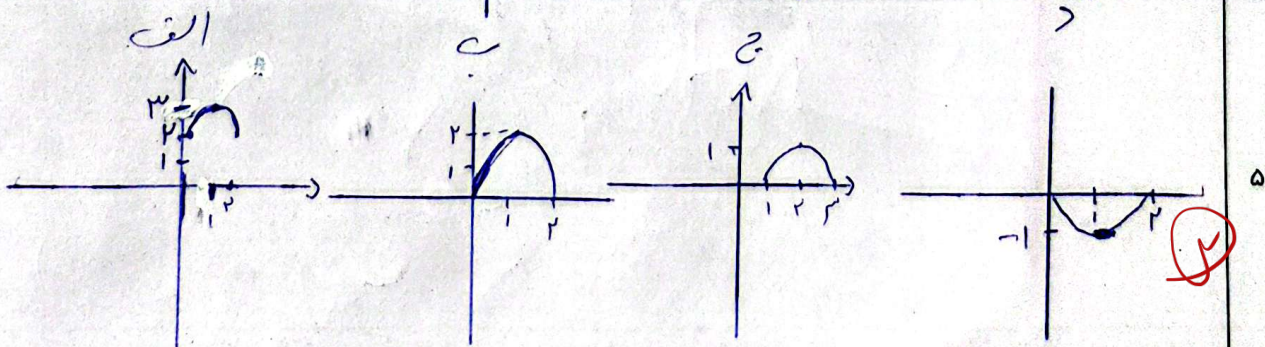
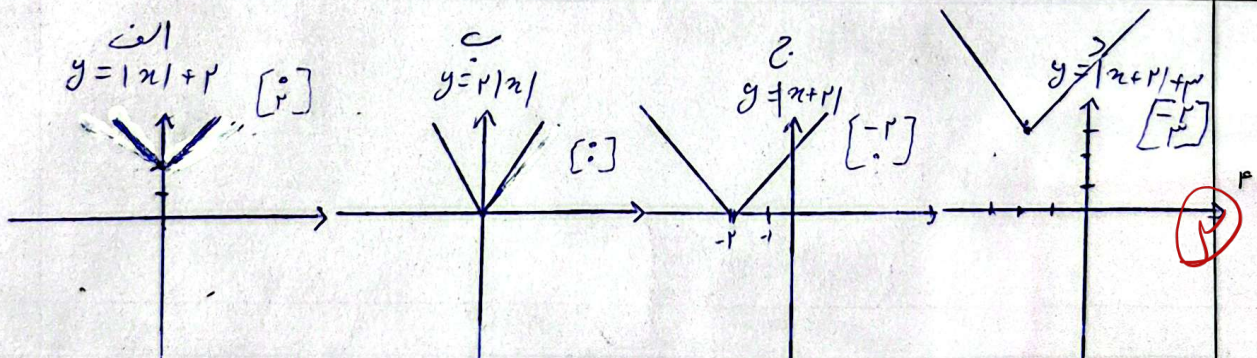
د) $y = \frac{x+4}{x^2-4x} \Rightarrow x^2-4x \neq 0 \Rightarrow (x^2-4x)(x^2+4x) \neq 0 \Rightarrow (x(x-4))(x(x+4)) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x \neq 4 \end{cases} \Rightarrow D = \mathbb{R} - \{0, 4\}$

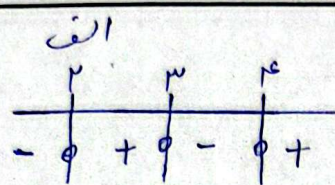
الف) $y = \sqrt{4-x} + \sqrt{x-2}$ $\begin{cases} 4-x \geq 0 \Rightarrow x \leq 4 \\ x-2 \geq 0 \Rightarrow x \geq 2 \end{cases} \Rightarrow D = [2, 4]$

ب) $y = \frac{3x+1}{x^2+1} \Rightarrow x^2+1 \neq 0 \Rightarrow D = \mathbb{R}$

ج) $y = \frac{\sqrt{x-2}}{x-4} \Rightarrow x-4 \neq 0 \Rightarrow x \neq 4 \Rightarrow D = [2, \infty) - \{4\}$

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

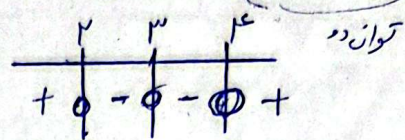




$$[2, 3] \cup [4, +\infty)$$

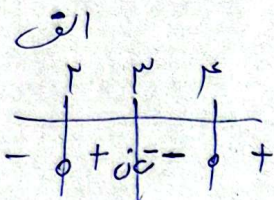
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ب) $y = (x-2)(x-3)^2(x-4)$

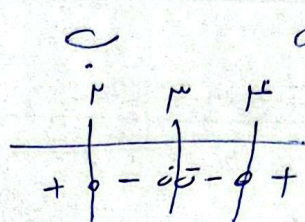


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$$(-\infty, 2] \cup [3] \cup [4, +\infty)$$

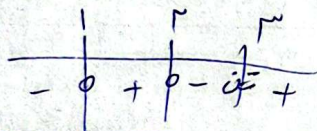


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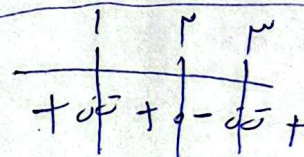


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الف) $y = x^3 - 3x^2 + 2 = \frac{(x-2)(x-1)}{x-3}$



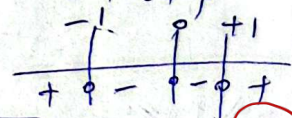
ب) $y = \frac{x^3 - 3x^2 + 2}{x^3 - 4x^2 + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$



الف) $y = \frac{x^4 - x^2}{x^2 + x + 1}$ ~~بمگر ریشه ها و جدول~~ $= \frac{(x^2 - x)(x^2 + x)}{x^2 + x + 1} = \frac{(x(x-1))(x(x+1))}{x^2 + x + 1}$

$\Delta = \sqrt{1^2 - 4(1 \times 1)} = \sqrt{-3}$

$\Delta = \sqrt{3^2 - 4(1 \times 1)} = \sqrt{5}$



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

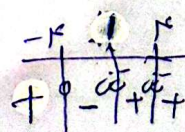
$\Delta = \sqrt{(2)^2 - 4(1 \times 3)} = \sqrt{-10}$

بسیار ریشه دارد و ریشه ها شبیه است

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

$(-\infty, -1) \cup (-1, 1) \cup (1, +\infty)$

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



$(-\infty, -1] \cup (1, 2) \cup (2, +\infty)$