نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱ کلاس .....

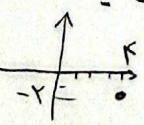
۱

الف) $y^2 - x = 2x^2 \to y^2 = 2x^2 + x \to$ تابع نیست

$y_1 = 2x^2 + x$, $y_2 = 2x^2 + x$ $\Rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$ تابع است

ب) $|y| + x^2 = x + 4$ مثال نقض $\to x = 1 \Rightarrow |y| + 1 = 4 \Rightarrow y = \pm 3$ تابع نیست

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



د) $x = \cos y$ مثال نقض $\to x = 0 \to y = 90, 270 \Rightarrow$ تابع نیست

۲

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

ب) $y = \frac{x+4}{x^2 - 4x^2}$ $\quad x^2(x-2)(x+2) \neq 0$ $\quad D_f = \mathbb{R} - \{0, 2, -2\}$

ب) $y = \frac{x+4}{x^2 - 7x + 14}$ $\quad x^2 - 7x + 14 \neq 0$ $\quad \Delta$ منفی است $\Rightarrow$ همیشه مخرج صفر نمی‌شود $\quad D_f = \mathbb{R}$

ج) $y = \frac{x+4}{x^2 + x + 4}$ $\quad x^2 + x + 4 \neq 0$ $\quad \Delta$ منفی است $\Rightarrow$ همیشه مخرج صفر نمی‌شود $\quad D_f = \mathbb{R}$

۳

الف) $y = \sqrt{4-x} + \sqrt{x-2}$ $\quad 4 - x \geq 0$ $\quad x - 2 \geq 0$

$4 \geq x \quad \cap \quad x \geq 2 \Rightarrow 2 \leq x \leq 4$ $\quad D_f = [2, 4]$

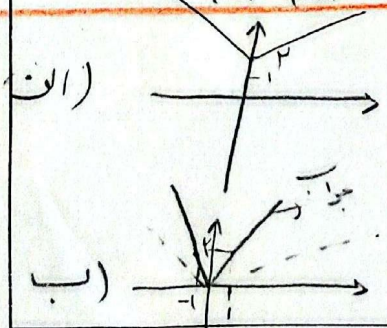
ب) $y = \frac{2x+1}{x^2+1}$ $\quad x^2 + 1 \neq 0$ همواره مثبت است $\Rightarrow D_f = \mathbb{R}$

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

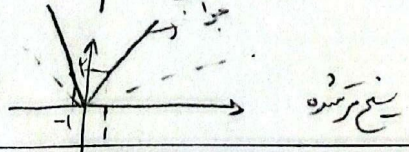
د) $y = \frac{2x+3}{|x| + x^2}$ $\quad |x| + x^2 \neq 0$ همواره مثبت است $\Rightarrow D_f = \mathbb{R}$

۴

الف)



ب)



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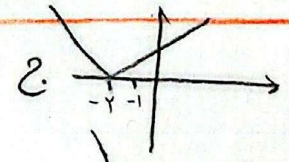

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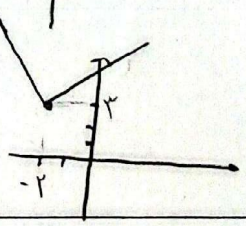

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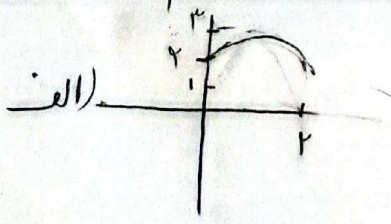

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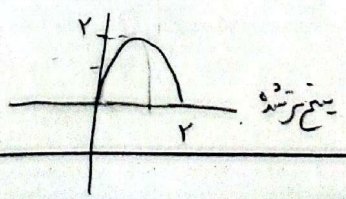

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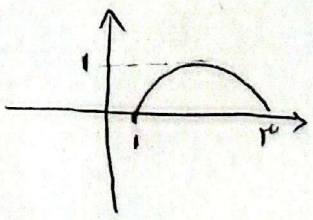

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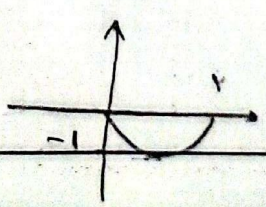

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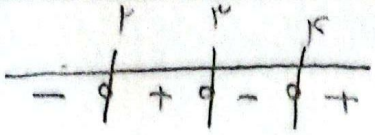
الف)



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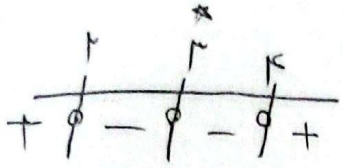

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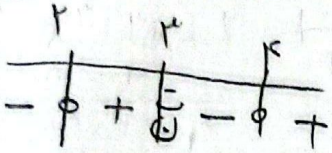
الف)



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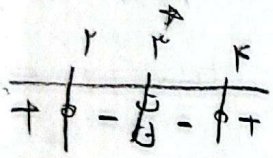
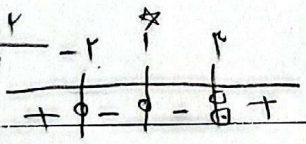


۸

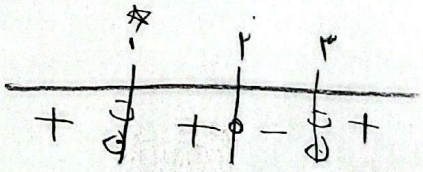
الف)

$$\begin{array}{r|l} x^3-3x+2 & x-1 \\ \hline x^3-x^2 & x^2+x-4 \\ \hline -x^2-2x+2 & \\ -x^2+x & \\ \hline -3x+2 & \\ -3x+3 & \\ \hline -1 & \end{array}$$

$$\frac{(x-1)^2(x+2)}{x-4}$$

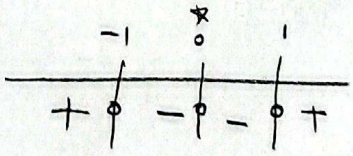


$$\frac{(x-1)(x-2)}{(x-4)(x-1)}$$



۹

الف) $\dfrac{x^2(x-1)(x+1)}{x^2+x+2}$ ← $\Delta<0$ ⇒ ریشه ندارد



ب) $\dfrac{x^2+3x+4}{x^2+2x+2}$

$x^2+3x+4 \to \Delta = 9-16 = -7 \Rightarrow \Delta<0 \Rightarrow$ ریشه ندارد

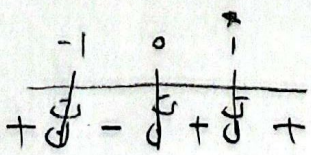
$x^2+2x+2 \to \Delta = 4-12 = -8 \Rightarrow \Delta<0 \Rightarrow$ ریشه ندارد

$\Rightarrow$ همواره مثبت است

۱۰

الف)

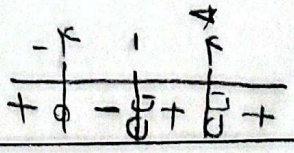
$$\sqrt{\frac{(x-1)(x^2+1+x)}{x(x-1)(x+1)}}$$



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

ب)

$$\sqrt{\frac{(3+x)(3-x)}{(x-1)(1-x)}}$$



$D_f = (-\infty,-3] \cup (1,3) \cup (3,+\infty)$

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