نام و نام خانوادگی ..... علیرضا آئینی عشری ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... دهم B .....

۱

الف) $y^3 - x = 2x^2 \rightarrow \begin{cases} y_1^3 = 2x^2 + x \\ y_2^3 = 2x^2 + x \end{cases} \Rightarrow y_1^3 = y_2^3 \Rightarrow \boxed{y_1 = y_2} \Rightarrow$ تابع است.

ب) $|y| + x^2 = x + 3 \xrightarrow{x=1} |y| = x + 3 - x^2 \Rightarrow y = \pm 3 \Rightarrow$ تابع نیست.

ج) $\sqrt{x-4} + |y-2| = 0 \rightarrow \begin{matrix} x = 4 \\ y = 2 \end{matrix} \Rightarrow$ تابع است.

د) $x = \cos y \xrightarrow{x=0} \cos y = 0 \Rightarrow y = \{90, 270\} \Rightarrow$ تابع نیست.

۲

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

ب) $y = \frac{x+4}{x^2 - 7x + 16} \Rightarrow b^2 - 4ac = 49 - 4(16)(1) = -15 \Rightarrow$ ریشه ندارد. $\rightarrow D_f = \mathbb{R}$

ج) $y = \frac{x+4}{x^2 + x + 4} \Rightarrow b^2 - 4ac = 1 - 16 = -15 \Rightarrow$ ریشه ندارد. $\Rightarrow D_f = \mathbb{R}$

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

۳

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

ب) $y = \frac{3x+1}{x^2+1} \xrightarrow{\text{مخرج} \neq 0} x^2 + 1 \neq 0 \Rightarrow x^2 \neq -1 \Rightarrow D_f = \mathbb{R}$

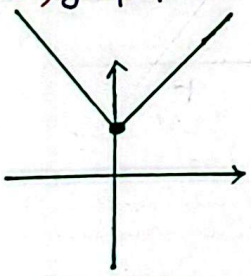
ج) $y = \frac{\sqrt{x-2}}{x-4} \rightarrow \begin{cases} x - 2 \geq 0 \Rightarrow x \geq 2 \\ x - 4 \neq 0 \Rightarrow x \neq 4 \end{cases} \Rightarrow D_f = [2, +\infty) - \{4\}$

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

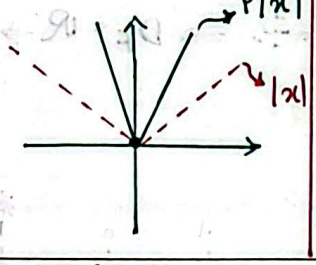
مثبت یا صفر ← مثبت تا صفر

۴

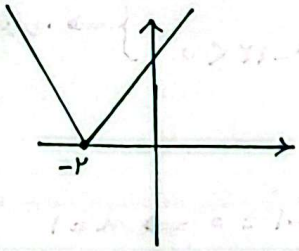
الف) $y = |x| + 2$



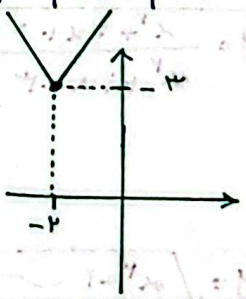
ب) $y = 2|x|$



ج) $y = |x + 2|$

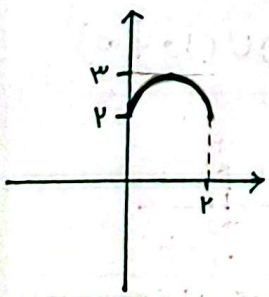


د) $y = |x+2| + 3$

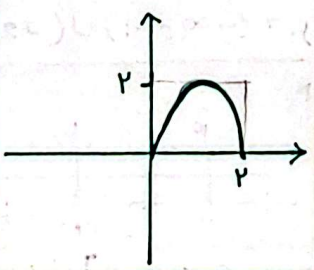


۵

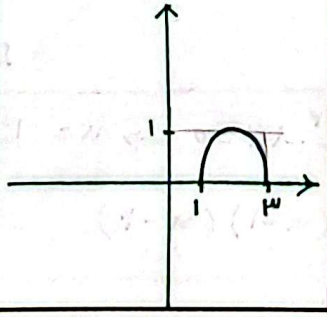
الف) $f(x) + 2$



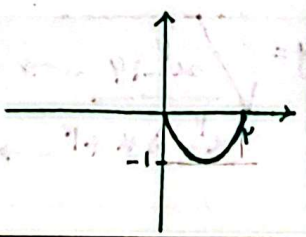
ب) $2f(x)$



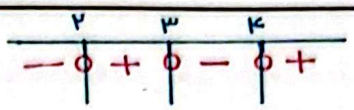
ج) $f(x-1)$



د) $-f(x)$

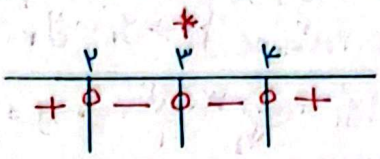


۶ الف) $y=(x-2)(x-3)(x-4)$



ریشه‌ها: ۴ و ۳ و ۲ ⟷

ب) $y=(x-2)(x-3)^2(x-4)$

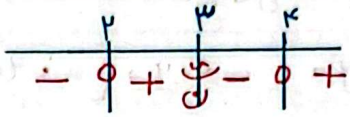


ریشه‌ها: ۴ و ۳ و ۲

↓

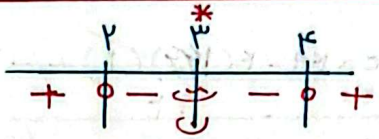
(مضاعف)

۷ الف) $y=\dfrac{(x-2)(x-4)}{x-3}$



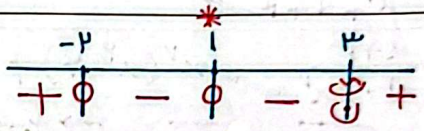
ریشه‌ها: ۴ و ۲ و ۳ (ت ن)

ب) $y=\dfrac{(x-2)(x-4)}{(x-3)^2}$

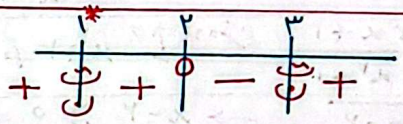


ریشه‌ها: ۴ و ۲ و ۳ (مضاعف) (ت ن)

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

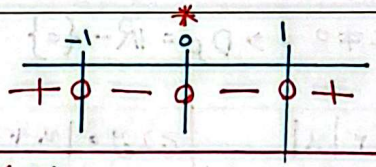


ب) $y=\dfrac{x^3-3x+2}{x^2-4x+3}=\dfrac{(x-1)(x-2)}{(x-1)(x-3)}$

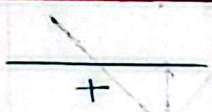


۹ الف) $\dfrac{x^4-x^2}{x^2+x+2}$ ($x^2(x^2-1)$)

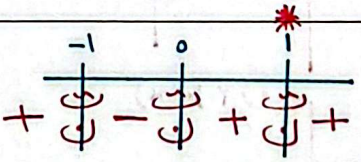
ریشه ندارد.



ب) $y=\dfrac{x^2+3x+4}{x^2+2x+3}$ → $9-16<0$ ، → $4-12<0$ ⟹ ریشه ندارد ⟹

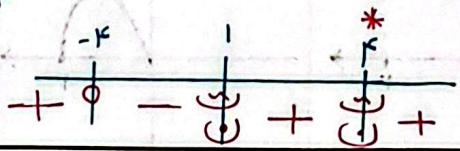


۱۰ الف) $y=\sqrt{\dfrac{x^3-1}{x^3-x}}$ → $x^3-1=0 \Rightarrow x=1$ ، → $x(x^2-1)=0$



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

ب) $y=\sqrt{\dfrac{x^2-14}{x^2-5x+4}}$ → $x^2-14=0 \Rightarrow x=\pm 4$ ، → $(x-1)(x-4)$



$D_f=(-\infty,-4]\cup(1,4)\cup(4,+\infty)$