نام و نام خانوادگی: زهرا دهقانی | پاسخنامه تشریحی تکلیف شماره ۳ | کلاس: دهم دبستانی A

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

ب) $|y| + x^2 = x + 3 \xrightarrow{x=0} |y| = 3 \rightarrow y = \pm 3$ تابع نیست

ج) $\sqrt{x-4} + |y-2| = 0 \rightarrow \begin{cases} x - 4 = 0 \rightarrow x = 4 \\ y - 2 = 0 \rightarrow y = 2 \end{cases} \rightarrow (4, 2)$ تابع است

د) $x = \cos y$ اگر $x = 0$، برای y چندین مقدار قابل محاسبه است $\Rightarrow$ پس تابع نیست

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الف) $y = \frac{x+4}{x^2 - 4x}$ $\rightarrow x = -4$ $\rightarrow x(x-4) = 0$

-4		0		4	
	$-$	۰	$+$	∄	$-$

$x = 0$ $x = 4$

$D_f = (4, +\infty) \cup [-4, 0)$

ب) $y = \frac{x+4}{x^2 - 8x + 16}$

$\Delta = b^2 - 4ac$

Δ (خروج) $= 64 - 64 = -16$

$D_f = R$

ج) $y = \frac{x+4}{x^2 + x + 4}$

$\Delta = b^2 - 4ac$

Δ (خروج) $= 1 - 4 = -3$

$D_f = R$

د) $y = \frac{x+4}{x^2 - 4x^2}$ $\rightarrow x = -4$

$x^2(x^2 - 4) = 0$

$x = 0$ $x = \pm 2$

-4		-2		0		2	
	$+$	∄	$-$	۰	$+$	∄	$-$

$D_f = (-\infty, -4) \cup (-2, 0) \cup (2, +\infty)$

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

$4 - x \geq 0 \rightarrow 4 \geq x$

$x - 2 \geq 0 \rightarrow x \geq 2$

$4 \geq x \geq 2$

$D_f = [2, 4]$

ب) $y = \frac{3x+1}{x^2+1}$ $\rightarrow x = \frac{1}{3}$

$x = \pm 1$

-1		$\frac{1}{3}$		1	
	$-$	۰	$+$	∄	$+$

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

ج) $y = \frac{\sqrt{x-2}}{x-4}$ $\rightarrow x - 2 \geq 0$ $x \geq 2$

$x = 4$

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

د) $y = \frac{2x+3}{|x| + x^2}$ $\rightarrow x \in \mathbb{R}$ $x = -\frac{3}{2}$

$-\frac{3}{2}$		0	
	$-$	۰	$+$

$D_f = [-\frac{3}{2}, +\infty)$

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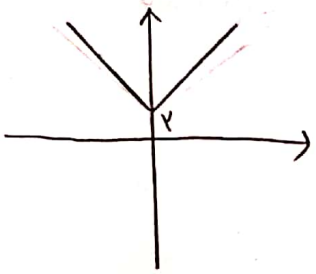
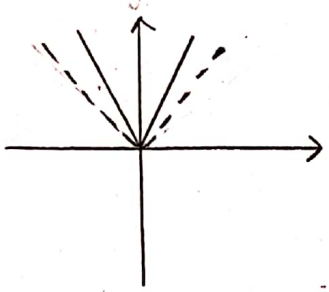
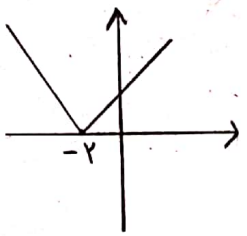
الف) $y = |x| + 2$



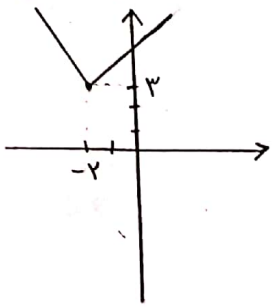
ب) $y = 2|x|$



ج) $y = |x + 2|$



د) $y = |x + 2| + 3$



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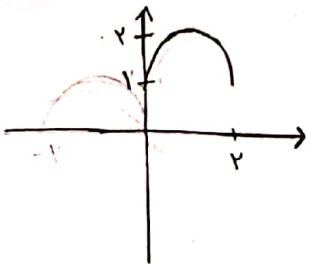
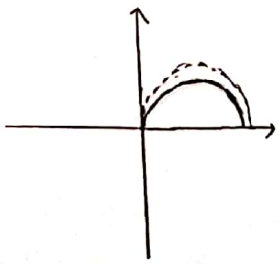
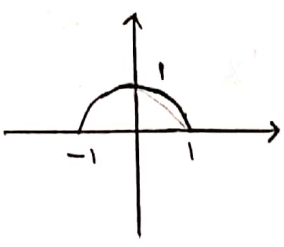
الف) $f(x) + 2$



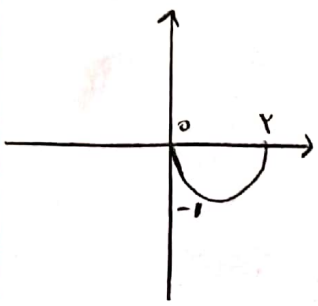
ب) $2f(x)$



ج) $f(x - 1)$



د) $-f(x)$



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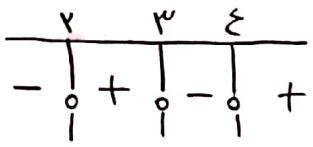
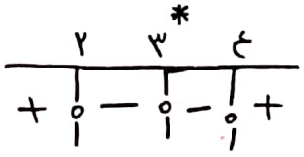
الف) $y=(x-2)(x-3)(x-4)$

$x-2=0 \Rightarrow x=2$, $x-3=0 \Rightarrow x=3$, $x-4=0 \Rightarrow x=4$



ب) $y=(x-2)(x-3)^2(x-4)$

$x=2$, $x=3$, $x=4$



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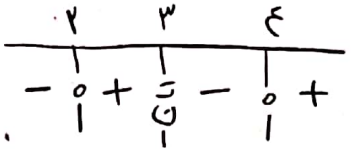
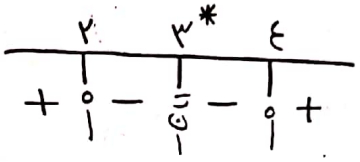
الف) $y=\dfrac{(x-2)(x-4)}{x-3} \Rightarrow x=2 , x=4$

$x-3=0 \Rightarrow x=3$



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

$(x-3)^2=0 \Rightarrow x=3$



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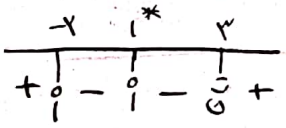
الف) $y=\dfrac{x^3-3x+2}{x-3}$ چون مجموع ضرایب صفر است، پس بر $x-1$ بخش‌پذیر می‌باشد

$\Rightarrow \dfrac{(x-1)^2(x+2)}{x-3} \Rightarrow x=1 , x=-2$

$x-3=0 \Rightarrow x=3$



$x^3-3x+2 \;\big|\; x-1$

$-x^3+x^2$

x^2-3x+2

$-x^2+x$

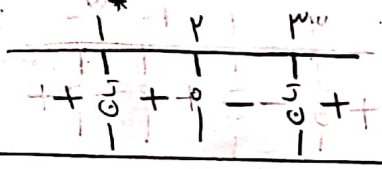
$-2x+2$

$+2x-2$

0

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

$\Rightarrow (x-1)(x-3) \rightarrow x=1 , x=3$



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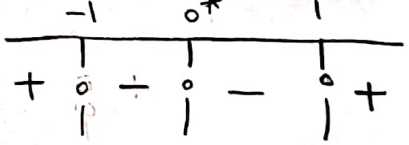
الف) $y=\dfrac{x^4-x^2}{x^2+x+2} \Rightarrow x=0 , x=1 , x=-1$

$\Rightarrow$ همواره مثبت



ب) $\dfrac{x^2+3x+2}{x^2+2x+3} \Rightarrow$ همواره مثبت

$\Delta=b^2-4ac$

Δ (مخرج) $=4-12=-8$

Δ (صورت) $=9-8=1$

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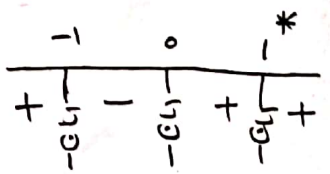
الف) $y=\sqrt{\dfrac{x^3-1}{x^3-x}} \Rightarrow \dfrac{x^3-1}{x^3-x} \geqslant 0$

$x^3-1=0 \Rightarrow x=1$

$x^3-x=0 \Rightarrow x=0 , x=-1 , x=1$

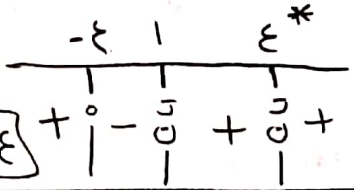


$D_f=(-\infty,-1)\cup(0,1)\cup(1,+\infty)$

ب) $\sqrt{\dfrac{x^2-16}{x^2-5x+4}} \Rightarrow \dfrac{x^2-16}{(x-1)(x-4)} \geqslant 0$

$x^2-16=0 \Rightarrow x=\pm 4$

$(x-1)(x-4)=0 \Rightarrow x=1 , x=4$



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

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