

الف) $y_1^3 = 2x^2 + x$ $y_2^3 = 2x^2 + x \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2 \Rightarrow$ تابع است

ب) $|y| + x^2 = x + 1 \Rightarrow x = 0 \Rightarrow |y| = 1 \Rightarrow y = \pm 1 \Rightarrow$ تابع نیست

ج) $\sqrt{x-2} + |y-1| = 0 \Rightarrow \begin{cases} x-2=0 \Rightarrow x=2 \\ y-1=0 \Rightarrow y=1 \end{cases} \Rightarrow \{2, 1\} \Rightarrow$ تابع

د) $x = \cos y \Rightarrow x = 0 \Rightarrow \cos y = 0 \Rightarrow y = \left(\frac{\pi}{2}, \frac{3\pi}{2}\right) \Rightarrow$ تابع نیست

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

ب) $y = \frac{x+4}{x^2-7x+14} \Rightarrow D_f = \mathbb{R} \infty, \infty$ ج) $y = \frac{x+4}{x^2+x+4} \Rightarrow D_f = \mathbb{R} \infty, \infty$

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

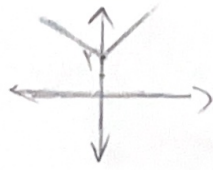
الف) $y = \sqrt{4-x} + \sqrt{x-2} = \Rightarrow \begin{cases} 4-x \geq 0 \Rightarrow x \leq 4 \\ x-2 \geq 0 \Rightarrow x \geq 2 \end{cases} \Rightarrow x \in [2, 4] \Rightarrow D_f = [2, 4] \infty, \infty$

ب) $y = \frac{x+1}{x^2+1} \Rightarrow x^2+1 > 0 \Rightarrow D_f = \mathbb{R} \infty, \infty$

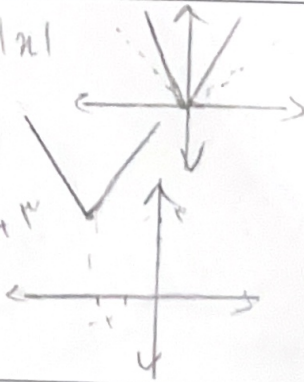
ج) $\frac{\sqrt{x+1}}{x-4} \Rightarrow \begin{cases} x+1 \geq 0 \Rightarrow x \geq -1 \\ x-4 \neq 0 \Rightarrow x \neq 4 \end{cases} \Rightarrow (-1, +\infty) - \{4\} \infty, \infty$

د) $\frac{x+1}{|x|+x^2} \Rightarrow |x|+x^2 \neq 0 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\} \infty, \infty$

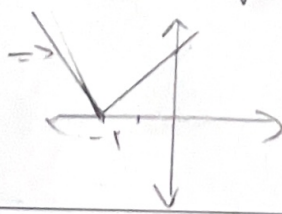
الف) $y = |x| + 1 \Rightarrow$



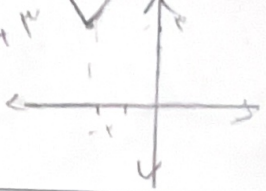
ب) $y = 2|x|$



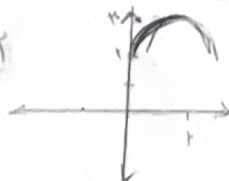
ج) $y = |x+1| \Rightarrow$



د) $y = |x+1| + 1 \Rightarrow$



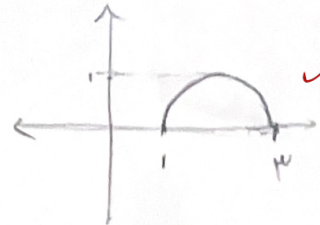
الف) $f(x) + 1 \Rightarrow$



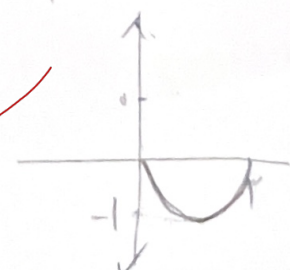
ب) $2f(x) \Rightarrow$



ج) $f(x-1) \Rightarrow$

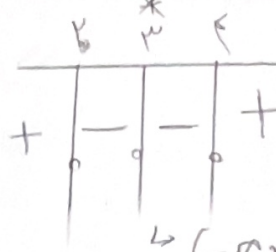
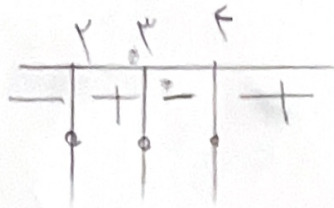


د) $-f(x) \Rightarrow$



ا) $(n-1)(n-2)(n-3)$

ب) $(n-1)(n-2)^2(n-3)$



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$(-\infty, 1] \cup [2, 3] < 0$

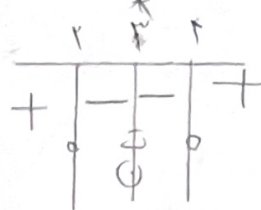
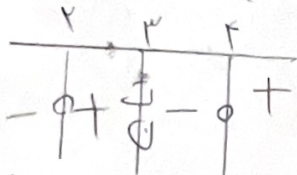
$[1, 2] \cup [3, +\infty) > 0$

$(-\infty, 1] \cup [3, +\infty) > 0$

$[1, 2] < 0$

ا) $y = \frac{(n-1)(n-3)}{n-2}$

ب) $\frac{(n-1)(n-3)}{(n-2)^2}$

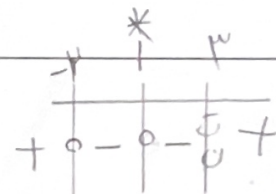


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$[1, 2] \cup [3, +\infty) > 0$
 $(-\infty, 1] \cup (2, 3] < 0$

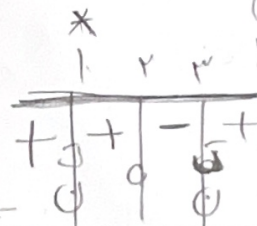
$(-\infty, 1] \cup [3, +\infty) > 0$
 $[2, 3] < 0$

ا) $\frac{n^3 - 3n^2 + 2}{n-2} = (n-1)(n^2 + n - 2) = \frac{(n-1)(n-1)(n+2)}{n-2}$



$(-\infty, -1] \cup (2, +\infty) > 0$

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

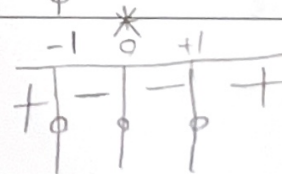


$[2, 3] < 0$

$[2, 3] < 0$

$(-\infty, 1] \cup (3, +\infty) > 0$

ا) $\frac{n^4 - n^2}{n^2 + n + 1} = n^2(n^2 - 1) = n^2(n-1)(n+1)$



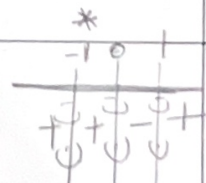
$\Delta = -V < 0 \Leftrightarrow$
 له جذور حقيقيتين

$(-\infty, -1] \cup [1, +\infty) > 0$
 $[-1, 1] < 0$

$\Delta < -V < 0 \Leftrightarrow$
 له جذور حقيقيتين

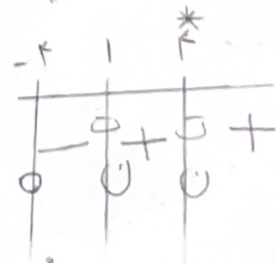
ب) $y = \frac{n^3 + 3n^2 + 2}{n^2 + 2n + 3} \Rightarrow \Delta = -1 < 0 \Rightarrow$ له جذور حقيقيتين

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



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

ب) $\frac{n^2 - 19}{n^2 - 8n + 6} = \sqrt{\frac{(n-4)(n+5)}{(n-1)(n-6)}} + \dots$



$D_f = (-\infty, -4) \cup (1, 6) \cup (6, +\infty)$