

نام و نام خانوادگی نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۳... کلاس رشته R.....

الف) $y^3 - x = 2x^2$ $\begin{cases} y_1^3 = 2x^2 + x \\ y_2^3 = 2x^2 + x \end{cases} \Rightarrow y_1 = y_2 \Rightarrow y_1 = y_2$ $\begin{cases} y_1 = y_2 \text{ if } (x, y) \in F \\ y_1 = y_2 \text{ if } (x, y) \in F \end{cases}$ (تابع هست)

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

ج) $\sqrt{x-4} + |y-2| = 0$ $\begin{cases} x-4=0 \\ |y-2|=0 \end{cases} \Rightarrow \begin{cases} x=4 \\ y=2 \end{cases}$ (تابع هست) $\star$ در عبارت جمله مثبت حاصل شده منفرست می شود اما باید برحاصل منفرست باشد.

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

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

ب) $y = \frac{x+4}{x^2-7x+14}$ $x^2-7x+14=0 \Rightarrow \Delta = b^2-4ac = 49 - 4(14) = -15$ $\Rightarrow D_f = \mathbb{R}$

ج) $y = \frac{x+4}{x^2+x+4}$ $x^2+x+4=0 \Rightarrow \Delta = b^2-4ac = 1 - 4(4) = -15$ $\Rightarrow D_f \in (\mathbb{R})$

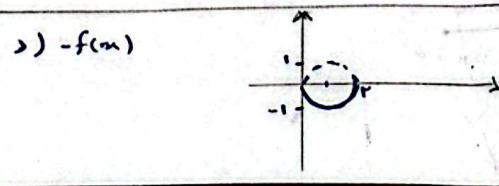
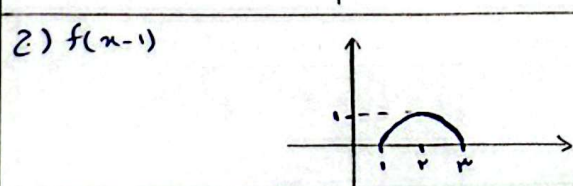
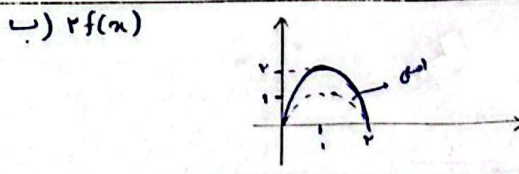
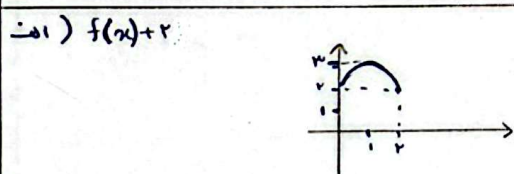
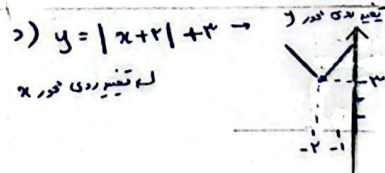
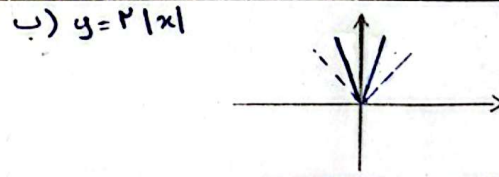
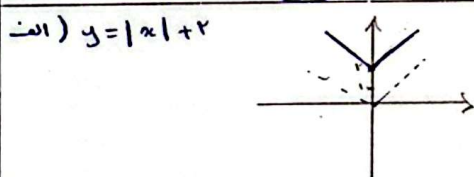
د) $y = \frac{x+4}{x^2-4x^2}$ $x^2-4x^2=0 \Rightarrow x^2(x-4)=0 \Rightarrow \begin{cases} x=0 \\ x=4 \end{cases} \Rightarrow D_f = \mathbb{R} - \{0, 4\}$

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

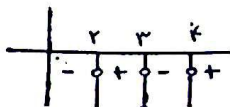
ب) $y = \frac{x+1}{x^2+1}$ $x^2+1=0 \Rightarrow x^2=-1$ $\Rightarrow D_f = \mathbb{R}$

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

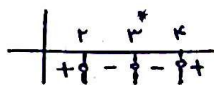
د) $y = \frac{x+4}{|x|+x^2}$ $|x|+x^2=0 \Rightarrow x=0$ $\Rightarrow D_f = \mathbb{R} - \{0\}$



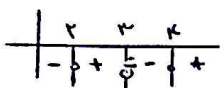
الف) $y = (x-2)(x-3)(x-4)$



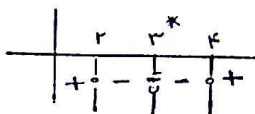
ب) $y = (x-2)(x-3)(x-4)$



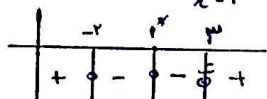
الف) $y = \frac{(x-2)(x-4)}{x-3}$



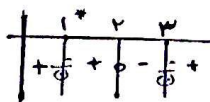
ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$



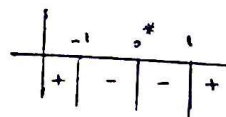
الف) $y = \frac{x^3 - 3x^2 + 2}{x^3 - 4x^2 + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$



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

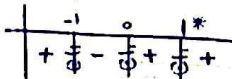


$\Delta = b^2 - 4ac = 1 - 4 = -3 < 0$

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

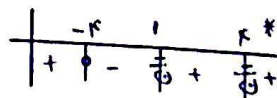
حالات: $\Delta = b^2 - 4ac = 9 - (4 \times 3) = -7 < 0$ $\Delta = b^2 - 4ac = 4 - (1 \times 3) = 1 > 0$

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



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

ب) $y = \frac{x^3 - 14}{x^3 - 6x^2 + 6} = \frac{(x-2)(x^2+2x+7)}{(x-1)(x-3)}$



$D_f = (-\infty, 1) \cup (1, 2) \cup (2, +\infty)$