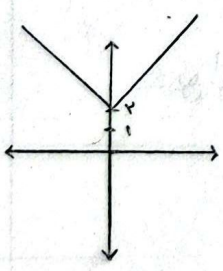
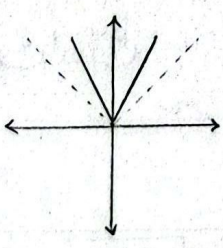
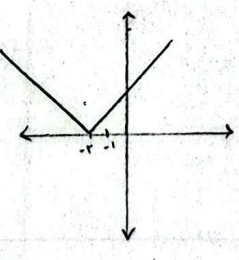
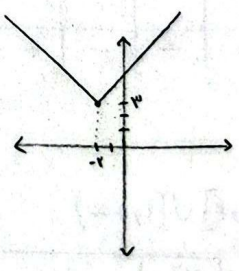
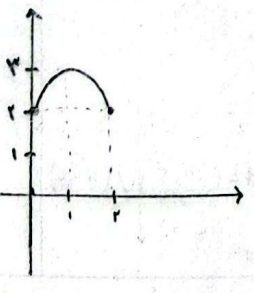
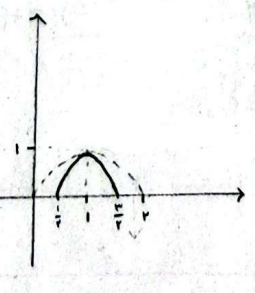
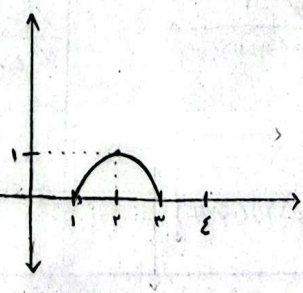
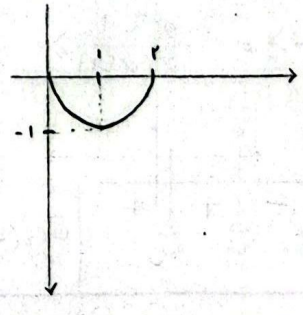
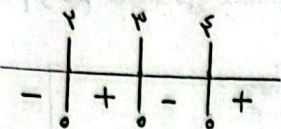
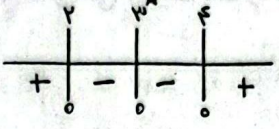
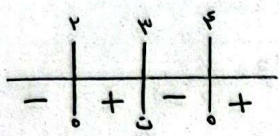
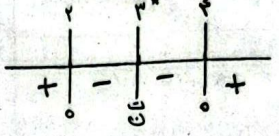
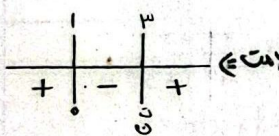
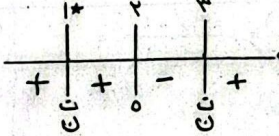
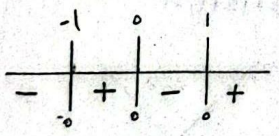
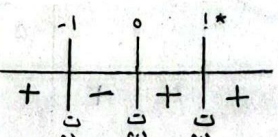
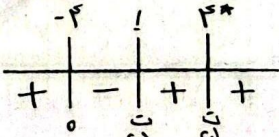


الف) $y^3 - x = 2x^2$ تعریف ریاضی: $\begin{cases} y_1^3 = 2x^2 + x \\ y_2^3 = 2x^2 + x \end{cases}$ $\Rightarrow y_1^3 = y_2^3$ $\Rightarrow y_1 = y_2$ تابع است.	ب) $y + x^2 = x + 3$ تعریف ریاضی: $\begin{cases} y_1 = x^2 + x + 3 \\ y_2 = -x^2 + x + 3 \end{cases}$ $\Rightarrow y_1 = y_2 $ $\Rightarrow y_1 = \pm y_2$ تابع نیست.	ج) $\sqrt{x-4} + y-2 = 0$ $\begin{cases} \sqrt{x-4} = 0 \\ y-2 = 0 \end{cases} \Rightarrow \begin{cases} x = 4 \\ y = 2 \end{cases}$ فقط $(4, 2)$ پس تابع است.	د) $x = \cos y$ مثلث متغیر: $x = 0 \Rightarrow y = 0, \pi, 2\pi, \dots$ پس عبارت تابع نیست.	۱
الف) $y = \frac{x+4}{x^2-4x}$ $x^2 - 4x = 0$ $\Rightarrow x(x-4) = 0$ $\Rightarrow x = 4, 0$	ب) $y = \frac{x+4}{x^2-7x+14}$ $x^2 - 7x + 14 \neq 0$ جواب با هیچ عددی منفی نشود.	ج) $y = \frac{x+4}{x^2+x+4}$ $x^2 + x + 4 \neq 0$ جواب با هیچ عددی منفی نشود.	د) $y = \frac{x+4}{x^2-4x^2}$ $x^2 - 4x^2 = 0$ $\Rightarrow x^2(x^2-4) = 0$ $\Rightarrow x = 2, 0$	۲
$D_f = \mathbb{R} - \{4, 0\}$	$D_f = \mathbb{R}$	$D_f = \mathbb{R}$	$D_f = \mathbb{R} - \{0, 2\}$	
الف) $y = \sqrt{4-x} + \sqrt{x-2}$ $\sqrt{4-x} + \sqrt{x-2} \neq 0$ جواب با هیچ عددی منفی نشود.	ب) $y = \frac{3x+1}{x^2+1}$ $x^2 + 1 = 0$ $\Rightarrow x^2 = -1$ $\Rightarrow x = \pm i$	ج) $y = \frac{\sqrt{x-2}}{x-4}$ $x-2 \geq 0 \Rightarrow x \geq 2$ $x-4 = 0 \Rightarrow x = 4$	د) $y = \frac{2x+3}{ x +x^2}$ $ x + x^2 = 0$ $\Rightarrow x = 0$	۳
$D_f = \mathbb{R}$	$D_f = \mathbb{R} - \{-1, 1\}$	$D_f = [2, +\infty) \cup \{4\}$	$D_f = \mathbb{R} - \{0\}$	
الف) $y = x + 2$ 	ب) $y = 2 x$ 	ج) $y = x+2$ 	د) $y = x+2 + 3$ 	۴
الف) $f(x) + 2$ 	ب) $f(x)$ 	ج) $f(x-1)$ 	د) $-f(x)$ 	۵

الف) $y = (x-2)(x-3)(x-4)$  تعیین علامت $\Leftarrow$ $D_f = [2, 3] \cup [4, +\infty)$	ب) $y = (x-2)(x-3)^2(x-4)$  تعیین علامت $\Leftarrow$ $D_f = (-\infty, 2] \cup [4, +\infty)$	۶
الف) $y = \frac{(x-2)(x-4)}{x-3}$  تعیین علامت $\Leftarrow$ $D_f = [2, 3) \cup [4, +\infty)$	ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$  تعیین علامت $\Leftarrow$ $D_f = (-\infty, 2] \cup [4, +\infty)$	۷
الف) $y = \frac{x^3 - 3x + 2}{x-3}$  تعیین علامت $\Leftarrow$ $D_f = (-\infty, 1] \cup (3, +\infty)$	ب) $y = \frac{x^3 - 3x + 2}{x^2 - 4x + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$  تعیین علامت $\Leftarrow$ $D_f = (-\infty, 2] \cup (3, +\infty)$	۸
الف) $y = \frac{x^2 - x^2}{x^2 + x + 2} = \frac{x^2(x^2 - 1)}{x^2 + x + 2} = \frac{x^2(x-1)(x+1)}{x^2 + x + 2}$ خرج فاکتور نشده است.  $D_f = [-1, 0] \cup [1, +\infty)$	ب) $y = \frac{x^2 + 3x + 2}{x^2 + 2x + 3}$ همواره مثبت است.	۹
الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}}$ $\frac{x^3 - 1}{x^3 - x} \geq 0 \Rightarrow \frac{x^3 - 1}{x(x^2 - 1)} \geq 0 \Rightarrow \frac{x^3 - 1}{x(x-1)(x+1)}$  $D_f = (-\infty, -1) \cup (0, +\infty)$	ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}}$ $\frac{x^2 - 14}{x^2 - 5x + 4} \geq 0 \Rightarrow \frac{(x-4)(x+4)}{(x-1)(x-4)} \geq 0$  $D_f = (-\infty, 4] \cup (1, +\infty)$	۱۰