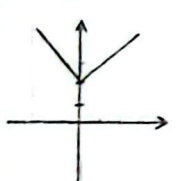
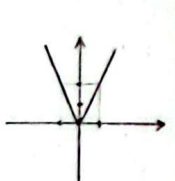
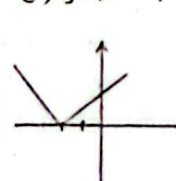
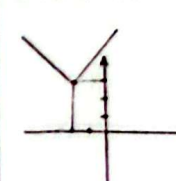
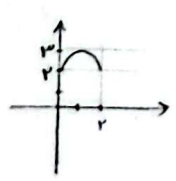
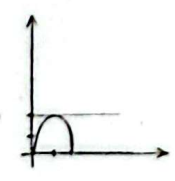
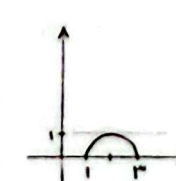
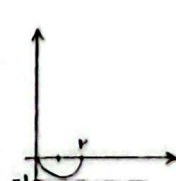


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الف) $y^3 - x = 2x^2$ $2x^2 + x = y^3$ $2x^2 + x = y^3$ $y^3 = y^3 \rightarrow y_1 = y_2$ <u>تابع نیست</u>	ب) $y + x^2 = x + 3$ $y + 1^2 = 1 + 3$ $y = 4 - 1 = 3$ $y = \pm 3$ <u>تابع نیست</u>	ج) $\sqrt{x-4} + y-2 = 0$ هر دو تایی هستند پس هر دو صفری باشند $\sqrt{x-4} = 0 \rightarrow x-4=0 \rightarrow x=4$ $y-2 =0 \rightarrow y-2=0 \rightarrow y=2$ $(4, 2)$ <u>تابع نیست</u>	د) $x = \cos y$ $0 = \cos y$ $[90, 270]$ <u>تابع نیست</u>	1
الف) $\frac{x+4}{x^2-4x} =$ $\frac{-4}{x+4}$ $\frac{x(x-4)}{-4}$ <u>$D_f = \mathbb{R} - \{0, 4\}$</u>	ب) $\frac{x+4}{x^2-7x+14} = \frac{-4}{x^2-7x+14}$ $x^2-7x+14$ $\Delta = b^2 - 4ac$ (ریشه ندارد) $(-7)^2 - 4 \times 1 \times 14 = -15$ <u>$D_f = \mathbb{R}$</u>	ج) $\frac{x+4}{x^2+x+4} = \frac{-4}{x^2+x+4}$ x^2+x+4 (ریشه ندارد) $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 \times 4 = -15$ <u>$D_f = \mathbb{R}$</u>	د) $\frac{x+4}{x^2-4x^2} = \frac{-4}{x^2(x+4)}$ $\frac{-4}{x^2(x+4)}$ <u>$D_f = \mathbb{R} - \{-2, -3\}$</u>	2
الف) $y = \sqrt{4-x} + \sqrt{x-2}$ $4-x \geq 0 \rightarrow 4 \geq x \rightarrow x \leq 4$ $x-2 \geq 0 \rightarrow x \geq 2$  $(x \geq 2) \cap (x \leq 4) = [2, 4]$ <u>$D_f = [2, 4]$</u>	ب) $y = \frac{x^2+1}{x^2+1}$ x^2+1 $\Delta = b^2 - 4ac = 0^2 - 4 \times 1 \times 1$ $\Delta = -4$ (ریشه ندارد) <u>$D_f = \mathbb{R}$</u>	ج) $y = \frac{\sqrt{x-2}}{x-4}$ $x-2 \geq 0 \rightarrow x \geq 2$ $x-4 \neq 0 \rightarrow x \neq 4$ <u>$\mathbb{R} = [2, +\infty) - \{4\}$</u>	د) $y = \frac{x^2+3}{ x +x^2}$ $x +x^2$ (ریشه نیست) <u>$D_f = \mathbb{R} - \{0\}$</u>	3
الف) $x +2$ 	ب) $2 x$ 	ج) $y = x+2$ 	د) $y = x+2 +3$ 	4
الف) $f(x) + 2$ 	ب) $2f(x)$ 	ج) $f(x-1)$ 	د) $-f(x)$ 	5

الف) $(x-1)(x-3)(x-4)$ $(x-1)(x-3)(x-4) = 0$ $x = 1, 3, 4$ $\frac{1}{-} \frac{1}{+} \frac{1}{-} \frac{1}{+}$	ب) $(x-1)(x-3)^2(x-4)$ $(x-1)(x-3)(x-3)(x-4) = 0$ $\frac{1}{+} \frac{1}{-} \frac{1}{-} \frac{1}{+}$	6
الف) $y = \frac{(x-1)(x-4)}{x-3}$ $\frac{(x-1)(x-4)}{x-3}$ $\frac{1}{-} \frac{1}{+} \frac{1}{0} \frac{1}{-} \frac{1}{+}$	ب) $y = \frac{(x-1)(x-4)}{(x-3)^2}$ $\frac{(x-1)(x-4)}{(x-3)(x-3)}$ $\frac{1}{+} \frac{1}{-} \frac{1}{0} \frac{1}{-} \frac{1}{+}$	7
الف) $\frac{x^3 - 1^3x + 1^3}{x-1^3}$ $a+b+c = 1-1^3+1^3 = 0$ $x^3 - 1^3x + 1^3 \mid x-1$ $-x^3 + x^2 \quad x^2 + x - 1$ $x^2 - 1^3x + 1^3$ $-x^2 + x \quad x + 1^3 - 1^3$ $-x^3 - 1^3x + 1^3 = (x-1)(x^2 + x - 1)$ $\frac{x^3 - 1^3x + 1^3}{x-1^3} = \frac{(x-1)(x^2 + x - 1)}{x-1^3}$ $\frac{1}{+} \frac{1}{-} \frac{1}{0} \frac{1}{-} \frac{1}{+}$	ب) $\frac{x^3 - 1^3x + 1^3}{x^3 - 1^3x + 1^3}$ $= \frac{(x-1)(x+1)(x-1)}{(x-1^3)(x-1)}$ $\frac{1}{+} \frac{1}{0} \frac{1}{+} \frac{1}{-} \frac{1}{0} \frac{1}{+}$	8
الف) $y = \frac{x^3 - x^2}{x^2 + x + 1}$ $\frac{x^3 - x^2}{x^2 + x + 1} = \frac{x^2(x-1)}{x^2 + x + 1} = \frac{x^2(x+1)(x-1)}{x^2 + x + 1}$ $x^2 + x + 1$ ریشه ندارد $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 \times 1 = 1 - 4 = -3$ $\frac{x^2(x+1)(x-1)}{x^2 + x + 1}$ ریشه ندارد $\frac{1}{+} \frac{1}{-} \frac{1}{-} \frac{1}{+}$	ب) $y = \frac{x^3 + 1^3x + 1^3}{x^2 + 1^2x + 1^3}$ $x^3 + 1^3x + 1^3$ $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 \times 1 = 1 - 4 = -3$ $\Delta = -3$ ریشه ندارد $x^3 + 1^3x + 1^3$ $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 \times 1 = 1 - 4 = -3$ $\Delta = -3$ ریشه ندارد	9
الف) $y = \sqrt{\frac{x^3-1}{x^3-x}}$ $\frac{x^3-1}{x^3-x} = \frac{(x-1)(x^2+x+1)}{x(x^2-1)} = \frac{(x-1)(x^2+x+1)}{x(x+1)(x-1)}$ $\frac{(x-1)(x^2+x+1)}{x(x+1)(x-1)} \geq 0$ $\frac{(x^2+x+1)}{x(x+1)(x-1)} \geq 0$ $\frac{1}{-} \frac{1}{+} \frac{1}{-} \frac{1}{+}$ $D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$	ب) $y = \sqrt{\frac{x^2-14}{x^2-5x+4}}$ $\frac{x^2-14}{x^2-5x+4} = \frac{(x+4)(x-4)}{(x-1)(x-4)} \geq 0$ $\frac{(x+4)(x-4)}{(x-1)(x-4)} \geq 0$ $\frac{-4}{+} \frac{1}{-} \frac{1}{0} \frac{1}{+}$ $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$	10