

شماره تکلیف: ۳

د به نام خدا

آتریسای آفا صال

(الف) $y^3 - x = 2x^2 \quad y^3 = 2x^2 + x \quad \sqrt[3]{y^3} = \sqrt[3]{2x^2 + x}$ تابع است، (۱)

(ب) $|y| + x^2 = x + 3 \Rightarrow x = 1 \quad y = \pm 3$ تابع نیست

(ج) $\sqrt{x-4} + |y-2| = 0$ تابع است. هر دو عبارت ۰ هستند

(د) $x = \cos y \Rightarrow x = \frac{\sqrt{3}}{2} \quad y = 30^\circ \text{ و } 330^\circ$ تابع نیست

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

(ب) $\Delta = b^2 - 4ac \rightarrow (-1)^2 - (4)(1)(16) = 1 - 64 = -63$ منفی $D_f = \mathbb{R}$ (۲)

(ج) $x^2 + x + 4 \rightarrow \Delta = (1)^2 - (4)(1)(4) = 1 - 16 = -15$ منفی $D_f = \mathbb{R}$

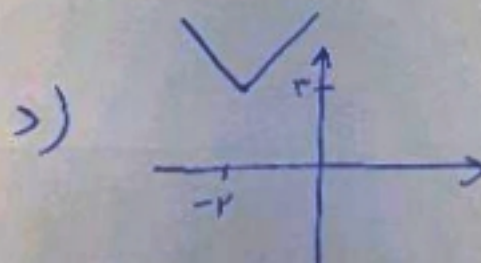
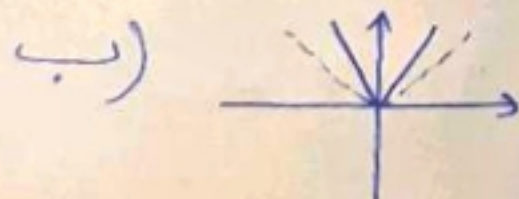
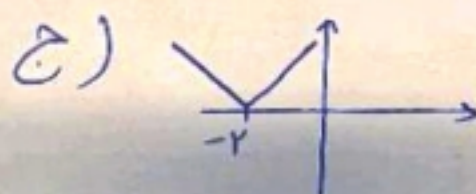
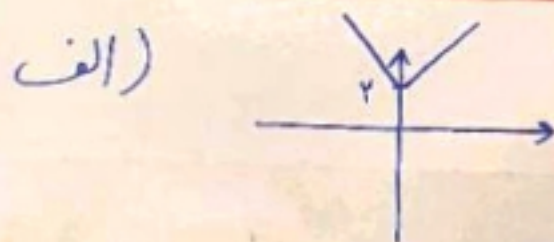
(د) $x^4 - 4x^2 = x^2(x^2 - 4) \quad D_f = \mathbb{R} - \{0, 4\}$

(الف) $6-x \geq 0 \quad x-2 \geq 0 \quad \frac{2}{+} \quad \frac{6}{-} \quad D_f = (-\infty, 2] \cup [6, +\infty)$ (۳)

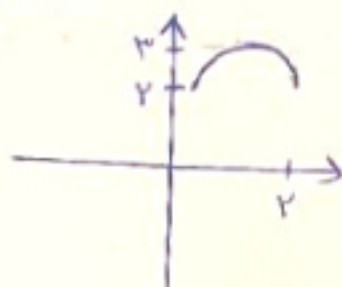
(ب) $x^2 + 1 \rightarrow + \quad D_f = \mathbb{R}$

(ج) $x-2 \geq 0 \quad x \geq 2 \quad \frac{2}{+} \quad \frac{4}{-} \quad (-\infty, 2] \cup (4, +\infty) = D_f$

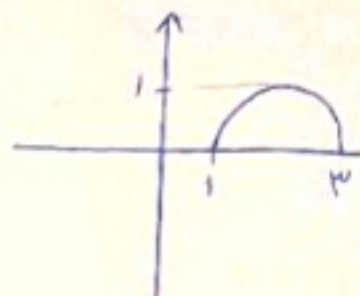
(د) $|x| + x^2 \neq 0 \quad |x| \neq -x^2 \quad D_f = \{0\}$



(الف)



(ج)

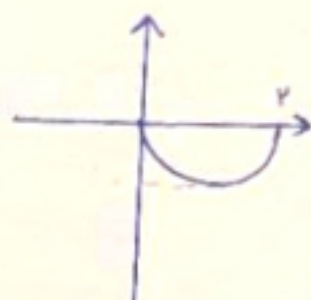


(د)

(ب)



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الف $\frac{2}{-} \frac{3}{+} \frac{4}{-} \frac{5}{+}$

ب $\frac{2}{+} \frac{3}{-} \frac{4}{-} \frac{5}{+}$

(ع)

الف $\frac{2}{-} \frac{3}{+} \frac{4}{-} \frac{5}{+}$

ب $\frac{2}{+} \frac{3}{-} \frac{4}{-} \frac{5}{+}$

(ف)

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

$\frac{2}{+} \frac{3}{-} \frac{4}{-} \frac{5}{+}$

ب $\frac{(x - 1)(x + 2)}{(x - 1)(x - 3)} \quad \frac{2}{+} \frac{3}{-} \frac{4}{-} \frac{5}{+}$

الف $x^3 - x^2 = x^2(x^2 - 1) \xrightarrow{\text{ریشه ها}} 0, 1 \quad x^2 + x + 2 \rightarrow \Delta = (1)^2 - (4)(1)(2) = \text{منفی}$

$\frac{0}{+} \frac{1}{-} \frac{2}{+}$

ب $x^2 + 3x + 4 \rightarrow \Delta = (3)^2 - (4)(1)(4) = \text{منفی}$

$x^2 + 2x + 3 \rightarrow \Delta = (2)^2 - (4)(1)(3) = \text{منفی}$

عبارت همواره مثبت
می باشد

الف $\frac{x^3 - 1}{x^3 - x} \geq 0$

$\frac{0}{-} \frac{1}{+} \frac{2}{+} \frac{3}{+} \quad D_f = [0, 1) \cup (1, +\infty)$ (10)

ب $\frac{x^2 - (4)^2}{(x - 1)(x - 4)} \geq 0$

$\frac{1}{-} \frac{4}{+} \frac{5}{+} \quad D_f = [1, 4) \cup (4, +\infty)$