

الف  $\rightarrow$   $\begin{cases} y_1^3 = 2x^2 + x \\ y_2^3 = 2x^2 + x \end{cases} \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$  تابع مست

ب  $y = \pm 3$   $|y| = 3 \rightarrow |y| + 5 = 8 \rightarrow x = 0$  مثال نقض اب تابع نیست

ج  $x - 4 = 0 \rightarrow x = 4$   $y - 2 = 0 \rightarrow y = 2$   $[4, 2]$  تابع د عبارت مثبت حاصل می شود پس هر کدام جدا مساوی است

د  $y = \frac{x}{2}, \frac{3x}{2}, \dots$   $\cos y = 0$   $x = 0$  مثال نقض د تابع نیست

ه  $x^2 - 4x = 0$   $x(x - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = 4 \end{cases}$   $D_f = \mathbb{R} - \{0, 4\}$   $D_f \in \mathbb{R}$   $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

و  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

ز  $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

ح  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

ط  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

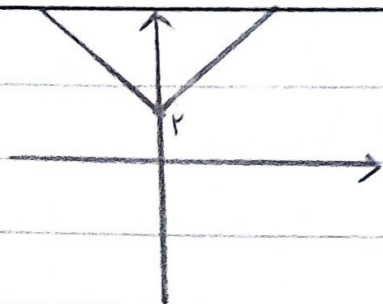
ی  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

ک  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$

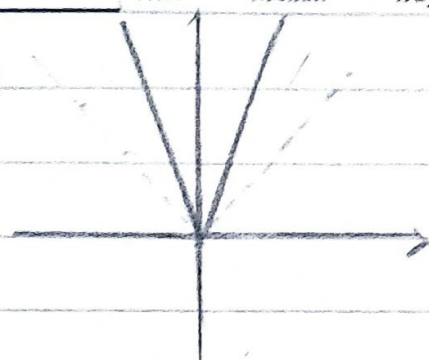
خ  $x^2 - 4x = 0$   $x(x - 4) = 0$   $\Delta = -16 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 + x + 4 = 0$   $\Delta = -15 < 0$   $D_f \in \mathbb{R}$   $x^2 - 4x^2 = 0 \rightarrow x^2(x^2 - 4) = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm 2 \end{cases}$   $D_f = \mathbb{R} - \{0, \pm 2\}$   $x^2 - 4x^2 = 0$   $x^2(x^2 - 4) = 0$   $x = 0$   $x^2 = 4 \rightarrow x = \pm 2$



الف

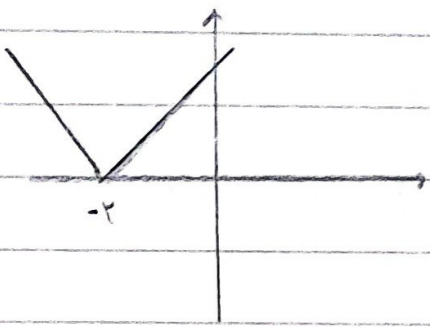


ب

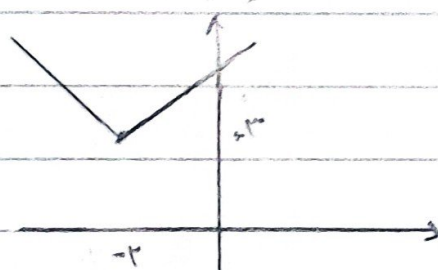


ج

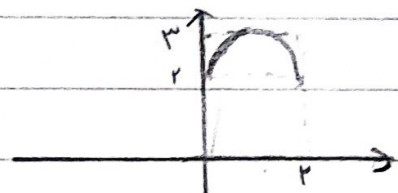
د



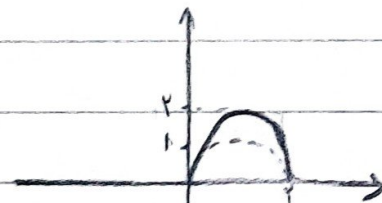
هـ



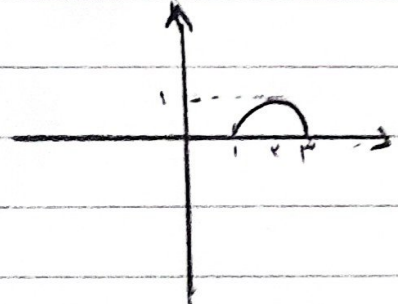
و



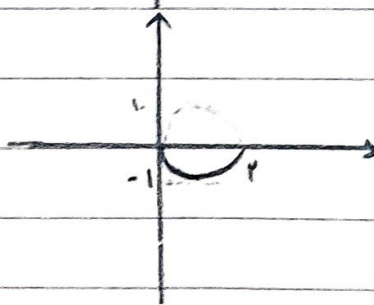
ز



ح



ط



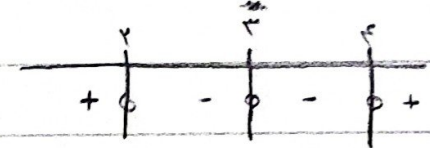
الف



$$D_f: [2, 3] \cup [4, +\infty)$$

ب

ب



$$D_f: (-\infty, 2] \cup \{3\} \cup [4, +\infty)$$



الف ۱  $\frac{x^2 - 3x + 2}{x^2 - 4}$   $D_f: [2, 3) \cup (4, +\infty)$  ✓

ب  $\frac{x^2 - 3x + 2}{x^2 - 4}$   $D_f: (-\infty, 2] \cup (4, +\infty)$

الف ۲  $y = \frac{(x-1)(x-2)}{x-3}$   $D_f: [1, 2] \cup (3, +\infty)$  ✓

ب  $y = \frac{(x-1)(x-2)}{(x-1)(x-3)}$   $D_f: (-\infty, 1) \cup (1, 2] \cup (3, +\infty)$

الف ۳  $\frac{x^4 - x^3}{x^3 + x + 2}$   $D_f: (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$  ✓

مخرج را یک مقدار نسبی می‌تواند باشد

ب  $\Delta = 9 - (4 \times 4) = -7 < 0$  صورت نسبی می‌تواند باشد

مخرج  $\Delta = 4 - (4 \times 3) = -8 < 0$

الف ۴  $\frac{x^3 - 1}{x^3 - x} > 0$   $D_f: (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$  ✓

ب  $y = \frac{(x-4)(x+4)}{(x-4)(x-1)} > 0$   $D_f: (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$