

(دوره هجده ط)

سوار تالیف ۳

نام: سفا فاضلی ۱۸, ۲۵

الف) $y^3 - x = 2x^2 \rightarrow \begin{cases} y_1^3 - x = 2x^2 \\ y_2^3 - x = 2x^2 \end{cases} \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$ به کمک تعریف راجع است

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ب) $|y| + x^2 = x + 3 \rightarrow \begin{cases} |y_1| + x^2 = x + 3 \\ |y_2| + x^2 = x + 3 \end{cases} \rightarrow |y_1| = |y_2| \rightarrow y_1 = \pm y_2$

ج) $\sqrt{x-4} + |y-2| = 0 \rightarrow y \rightarrow 2 \quad x \rightarrow 4$ مجموع دو عدد غیر منفی صفر شده و هر دو صفر تابع است

د) $x = \cos y \rightarrow x = 0 \rightarrow y = \frac{\pi}{2} \text{ و } \frac{3\pi}{2} \dots$ می تواند ۲۷۰ و ۹۰ و ... باشد پس تابع نیست

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

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

ج) $D_f = \mathbb{R}$ (همواره مثبت است)

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

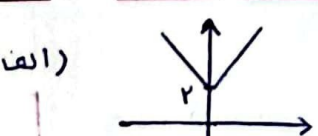
الف) $y = \sqrt{4-x} + \sqrt{x-2} \quad \begin{matrix} 4-x \geq 0 & x \leq 4 \\ x-2 \geq 0 & x \geq 2 \end{matrix} \quad (-\infty, 4] \cap [2, \infty) \rightarrow [2, 4] = D_f$

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

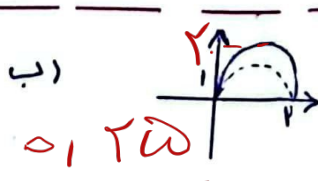
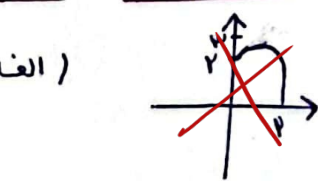
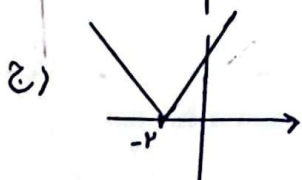
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ج) $x-4 \neq 0 \rightarrow x \neq 4 \quad \text{و} \quad x-2 \geq 0 \rightarrow x \geq 2 \rightarrow D_f = [2, \infty) - \{4\}$

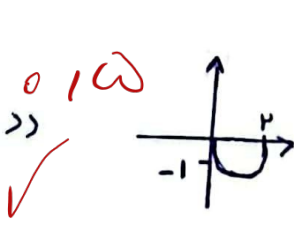
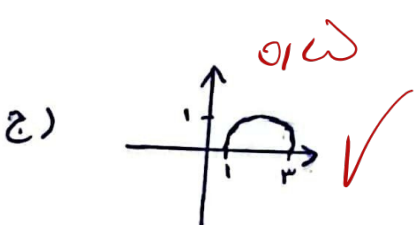
د) $D_f = R - \{0\}$



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الف)

$$\begin{array}{c|c|c|c} 2 & 3 & 4 & \\ \hline - & + & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$(x-2)(x-3)(x-4)=0$$

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ب)

$$\begin{array}{c|c|c|c} 2 & 3 & 4 & \\ \hline + & - & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$(x-2)(x-3)(x-4)=0$$

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الف)

$$\begin{array}{c|c|c|c} 2 & 3 & 4 & \\ \hline - & + & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$D_f = (4, \infty) \cup (2, 3)$$

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ب)

$$\begin{array}{c|c|c|c} 2 & 3 & 4 & \\ \hline + & - & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$D_f = (4, \infty) \cup (-\infty, 2)$$

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

$$\begin{array}{c|c|c|c} -2 & 1 & 3 & \\ \hline + & - & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$D_f = (4, \infty) \cup (-\infty, 2)$$

$$\begin{array}{r} x^3 - 2x^2 + 2 \quad | \quad x-1 \\ -x^3 + x^2 \\ \hline x^2 - 2x + 2 \\ -x^2 + x \\ \hline -x + 2 \\ -x + 2 \\ \hline 0 \end{array}$$

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ب) $\frac{(x-1)(x-2)}{(x-1)(x-3)}$

$$\begin{array}{c|c|c|c} 1 & 2 & 3 & \\ \hline + & 0 & - & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$D_f = (4, \infty) \cup (1, 2) \cup (-\infty, 1)$$

الف)

$D_f = \mathbb{R}$ (عبارت همیشه مثبت است و مثبت)

ب)

$D_f = \mathbb{R}$ ✓

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الف) $\frac{x^3-1}{x^3-x} \geq 0$

$$\frac{(x-1)(x^2+x+1)}{x^1(x+1)(x-1)}$$

$$\begin{array}{c|c|c|c} -1 & 0 & 1 & \\ \hline + & - & + & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

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

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ب) $\frac{x^2-14}{x^2-5x+4} \geq 0$

$$\frac{(x+4)(x-4)}{(x-1)(x-4)}$$

$$\begin{array}{c|c|c|c} -4 & 1 & 4 & \\ \hline + & - & + & + \\ \hline 0 & 0 & 0 & 0 \end{array}$$

$$D_f = (4, \infty) \cup (1, 4) \cup (-\infty, -4)$$