

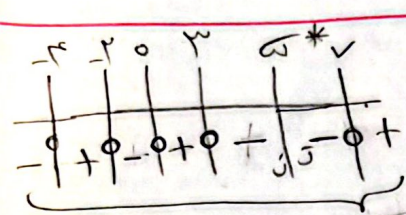
$$x^2 - 1 = -x^2$$

$$x^2 + 3x - 1 = 0$$

$$\frac{-3 \pm \sqrt{9 + 4}}{2} \Rightarrow \begin{cases} \text{ریشه} = 0/... \\ \text{ریشه خنثی} = 3/... \end{cases}$$

هیچ کدام از ریشه ها در بازه های قابل قبول سوال نیستند پس تابع است ✓

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$$f(x) \neq 3, 5, 7$$

$$x = 0$$

$$f(x-2) = 5, 7, -2$$

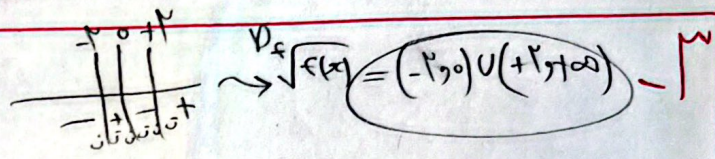
$$[-4, -2] \cup [0, 3] \cup [7, +\infty) = D_f$$

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$$x^2 - 4x = 0 \rightarrow x(x-4) = 0 \rightarrow x = 0, \pm 2$$

$$x^2 - 3x + 2 = 0 \checkmark$$

$$D_f(x) = \mathbb{R} - \{0, \pm 2\}$$

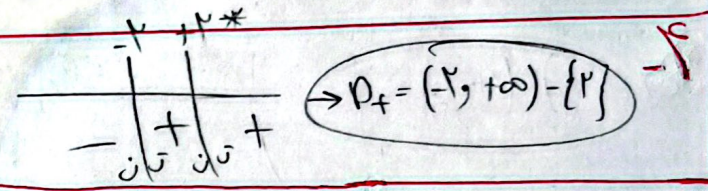


$$D_f(x) = (-2, 0) \cup (2, +\infty)$$

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الف) $x = 2$

$$x^2 - 2x - 1 = 0 \rightarrow (x-4)(x+2) = 0 \rightarrow x = \pm 2$$



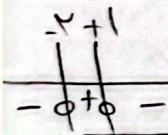
$$D_f = (-2, +\infty) - \{2\}$$

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ب) $|x| = 1 \rightarrow x = \pm 1$

$$|x-2| = x^2 \rightarrow \begin{cases} x > 0 \rightarrow x-2 = x^2 \rightarrow x^2 - x + 2 = 0 \rightarrow \Delta < 0 \\ x \leq 0 \rightarrow 2-x = x^2 \rightarrow x^2 + x - 2 = 0 \rightarrow (x+2)(x-1) \rightarrow x = -2, 1 \end{cases}$$

$$D_f(x) = [-2, +1] - \{-1\}$$



الف) $\sqrt{x(x-1)} \rightarrow x = 0, \pm 1$

$$D_f(x) = [-1, 0] \cup [1, +\infty)$$

$$\sqrt{|x|} + x \rightarrow |x| + x > 0 \rightarrow \mathbb{R}^+$$

$$D_f = [1, +\infty)$$

۴- ادامه سوال قسمت (ب)
همیشه + است. $x^2 + 1$
 $f = 2[-x]$
 $2 = [-x]$
 $x = [-2, 2]$

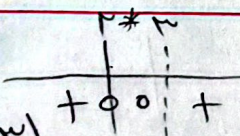
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$x = 2$

$$[x-2] = 0 \rightarrow [x] = 2$$

$$\hookrightarrow x = [2, 3]$$

$$D_f = \mathbb{R}$$



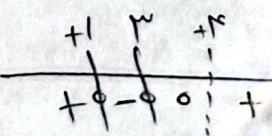
$$D_f = \mathbb{R} - [-2, -3]$$

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$x = 1$

$$[x-3] \Rightarrow x = [3, 4]$$

$$D_f = (-\infty, 1] \cup [3, +\infty)$$



$$||x-2|-1| = k \xrightarrow{k=1} x = 0, 2, 4 \xrightarrow{k=1}$$

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$$\frac{(x+1)(x+2)}{(x+1)(x+2)} \rightarrow \mathbb{R} - \{-2, -1, 1\} \rightarrow n=3 \rightarrow x^2 - 2nx + 3n = 0$$

$$x^2 - 6x + 9 = 0 \rightarrow (x-3)^2 = 0$$

$$x = 3 \leftarrow \text{یک ریشه}$$

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$$x > 0, x \neq 1$$

$$x+1 > 0 \rightarrow x > -1, x \neq 1 \Rightarrow n \Rightarrow (x > 0, x \neq 1) \Rightarrow D_f$$

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$$\begin{array}{c} -\omega \quad +\omega \\ | \quad | \\ - \quad + \end{array}$$

$\leadsto$

$$-\omega \leq \sqrt{3}x^2 - 1 \leq \omega$$

$$\rightarrow -\omega \leq \sqrt{3}x^2 - 1 \rightarrow -\omega + 1 \leq \sqrt{3}x^2 \checkmark$$

$$\rightarrow \sqrt{3}x^2 - 1 \leq \omega \rightarrow \sqrt{3}x^2 \leq \omega + 1 \rightarrow x^2 \leq \frac{\omega + 1}{\sqrt{3}}$$

$$\frac{1}{\sqrt{3}} \leq x \leq \frac{\omega + 1}{\sqrt{3}}$$

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