

شماره تکلیف ۴ - یازدهم سپهر B

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۱۱ یعنی تابع ما درجه یک است  $\leftarrow a=2$

$$2x+b=0$$

$$\Rightarrow x = \frac{-b}{2} = 3 \Rightarrow b = -6$$

۱۲ یعنی در معادله  $x^2+2x+2-m^2 \Delta \leq 0$  است.

$$x^2+2x+2-m^2 \Delta \leq 0 \rightarrow 4-4(2-m^2) \leq 0 \Rightarrow 4m^2+4 \leq 0 \Rightarrow 4(m+1)(m-1) \leq 0$$

$$\Rightarrow m = \left\langle \begin{matrix} 1 \\ -1 \end{matrix} \right\rangle \rightarrow 1-(-1)=2$$

۱۳  $f(x) = \frac{\sqrt{4-x^2}}{[x]+[-x]+1} \rightarrow 4-x^2 \geq 0 \rightarrow -2 \leq x \leq 2 \rightarrow \text{عدد صحیح}$

مخرج در ازای  $x \in \mathbb{Z}$  تعریف می شود.

$$\left\{ \begin{matrix} x \in \mathbb{Z} \\ x \neq -1 \end{matrix} \right\}$$

۱۴ الف)  $y = \sqrt{x^3+3x^2} \rightarrow x^3+3x^2 \geq 0 \rightarrow x^2(x+3) \geq 0 \rightarrow x \in [-3, +\infty)$

ب)  $y = \sqrt{\frac{(x^2-1)(x^3-3x^2)}{(x^3-1)}} \rightarrow \frac{(x+1)(x-1)(x^2)(x-3)}{(x-1)(x^2+x+1)} \geq 0 \rightarrow x \in (-\infty, -1] \cup \{0\} \cup [3, +\infty)$

۱۵ الف)  $y = \sqrt{|x-2|-3} \rightarrow |x-2| \geq 3 \rightarrow \begin{cases} x-2 \geq 3 \rightarrow x \geq 5 \\ x-2 \leq -3 \rightarrow x \leq -1 \end{cases} \Rightarrow D_f = \mathbb{R} - (-1, 5)$

ب)  $y = \sqrt{4-|2-x|} \rightarrow |2-x| \leq 4 \rightarrow \begin{cases} 2-x \geq -4 \rightarrow x \leq 6 \\ 2-x \leq 4 \rightarrow x \geq -2 \end{cases} \Rightarrow D_f = [-2, 6]$

۱۶ الف)  $y = \sqrt{1-x|x|} \rightarrow 1-x|x| \geq 0 \Rightarrow 1 \geq x|x|$

همیشه برقرار است

$$\Rightarrow D_f = (-\infty, 1]$$

ب)  $y = \frac{1}{\sqrt{3-|x-5|-1}}$

$$3-|x-5|-1 > 0 \rightarrow 2 > |x-5| \Rightarrow \begin{cases} x-5 < 2 \\ x-5 > -2 \end{cases} \Rightarrow \begin{cases} x < 7 \\ x > 3 \end{cases} \Rightarrow D_f = (3, 7)$$

الف)  $y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2} \right\}$

(V)

ب)  $y = \frac{\cos x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{2} \rightarrow D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{3} \right\}$

الف)  $y = \frac{x+3}{|2x+1| - |x+3|} \rightarrow |2x+1| \neq |x+3| \rightarrow \begin{array}{l} -2x-1 \neq -x-3 \quad | -2x-1 \neq x+3 \quad | 2x+1 \neq x+3 \\ -x-2 \neq 0 \quad \quad \quad 3x \neq -4 \quad \quad \quad \Rightarrow x \neq 2 \\ \Rightarrow x \neq 2 \quad \quad \quad x \neq -\frac{4}{3} \end{array}$

$\Rightarrow D_f = \mathbb{R} - \left\{ -\frac{4}{3}, 2 \right\}$

(A)

ب)  $y = \sqrt{|2x+1| - |x+3|} \rightarrow |2x+1| - |x+3| \geq 0 \rightarrow \begin{array}{l} -2x-1+x+3 \geq 0 \quad | -2x-1-x \quad | 2x+1-x-3 \\ -x+2 \geq 0 \quad \quad \quad -3 \geq 0 \quad \quad \quad \Rightarrow x-2 \geq 0 \\ \Rightarrow -x+2 \geq 0 \quad \quad \quad -2x \geq 4 \quad \quad \quad x \geq 2 \\ \Rightarrow x \leq 2 \quad \quad \quad x \leq -\frac{4}{2} \end{array}$

$\Rightarrow D_f = (-\infty, -\frac{4}{2}] \cup [2, +\infty)$

$f(x) = \sqrt{\log_{0.5}^{(2x-1)} \log_{0.5}^{2x-1}} \rightarrow \begin{array}{l} 2x-1 > 0 \rightarrow x > \frac{1}{2} \\ \log_{0.5}^{2x-1} > 0 \rightarrow 2x-1 > 1 \rightarrow x > 1 \end{array}$

$\log_{0.5}^{2x-1} > 0 \rightarrow \log_{0.5}^{2x-1} \leq 1 \Rightarrow 2x-1 \leq 0.5 \Rightarrow x \leq 1.5$

$D_f = (1, 1.5]$

(9)

الف)  $y = \log(2\cos x + 1) \rightarrow 2\cos x + 1 > 0$

(10)

$\Rightarrow \cos x > -\frac{1}{2} \Rightarrow D_f = (2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3})$

ب)  $y = \sqrt{\log \frac{x-1}{x+1}} \rightarrow \begin{array}{l} \frac{x-1}{x+1} > 0 \quad \frac{-1}{+1-1+} \rightarrow \mathbb{R} - [-1, 1] \\ \log_{1.0} \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1-x-1}{x+1} \geq 0 \\ \Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow x \leq -1 \\ \Rightarrow D_f = (-\infty, -1] \end{array}$