

نام و نام خانوادگی: شماره کلاس: ۴ یاد و نام: A.....

داده عبارت زیر را کامل کنید
 $f(x) = \sqrt{(a-2)x^2 + ax + b}$ دارد باید ضریب x^2 منفرجه
 $a-2=0 \Rightarrow a=2 \Rightarrow 2x+b \geq 0 \Rightarrow x \geq -\frac{b}{2}$
 $D_f = [3, +\infty) \Rightarrow [-\frac{b}{2}, +\infty) = [3, +\infty) \Rightarrow -\frac{b}{2} = 3 \Rightarrow b = -6$

$f(x) = \sqrt{x^2 + 2x + 2 - m^2}$ $\rightarrow$ آن را می توانیم دامنه برابر با R باشد عبارت زیر را کامل a ی آن یعنی ضریب x^2 مثبت Δ ی آن کوچکتر مساوی صفر باشد
 $\rightarrow \begin{cases} a > 0 \\ \Delta \leq 0 \end{cases} \Rightarrow 1 - (2 - m^2) \leq 0 \rightarrow 1 - (2 - m^2) \leq 0 \rightarrow m^2 - 1 \leq 0 \Rightarrow -1 \leq m \leq 1$
 $\Rightarrow m_{\max} - m_{\min} = 1 - (-1) = 2$

$f(x) = \frac{\sqrt{4-x^2}}{[x] + [-x] + 1}$ $\rightarrow \begin{cases} 4-x^2 \geq 0 \rightarrow -2 \leq x \leq 2 \\ [x] + [-x] + 1 \neq 0 \end{cases} \rightarrow \begin{cases} [x] + [-x] = 0 & x \in \mathbb{Z} \text{ آری} \\ [x] + [-x] = -1 & x \notin \mathbb{Z} \text{ آری} \end{cases}$
 $\Rightarrow x \in \mathbb{Z}$ برای اینکه خروجی منفرجه باشد باید x در بازه $[-2, 2]$ باشد
 $\Rightarrow D_f = \{-2, -1, 0, 1, 2\} \Rightarrow n D_f = 5$

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

$y = \sqrt{|x-2| - 3}$ $\rightarrow |x-2| - 3 \geq 0 \rightarrow |x-2| \geq 3 \rightarrow \begin{cases} x-2 \geq 3 \rightarrow x \geq 5 \\ x-2 \leq -3 \rightarrow x \leq -1 \end{cases}$
 $\Rightarrow D_y = (-\infty, -1] \cup [5, +\infty)$
 $y = \sqrt{4-|2-x|}$ $\rightarrow 4-|2-x| \geq 0 \rightarrow |2-x| \leq 4 \rightarrow -4 \leq 2-x \leq 4 \rightarrow -2 \leq x \leq 6$
 $\Rightarrow D_y = [-2, 6]$

الف) $y = \sqrt{1-x|x|} \rightarrow 1-x|x| \geq 0 \rightarrow x|x| \leq 1 \rightarrow \begin{cases} x^2 \leq 1 & x \geq 0 \\ x^2 \geq -1 & x < 0 \end{cases}$

$\rightarrow \begin{cases} 0 \leq x \leq 1 \\ \text{حالت دوم برای } x < 0 \text{ بررسی نمی شود} \end{cases} \xrightarrow{u} Df = (-\infty, 1]$

ب) $y = \frac{1}{\sqrt{3-|x-2|}-1} \rightarrow \begin{cases} 3-|x-2| \geq 0 \rightarrow |x-2| \leq 3 \rightarrow -3 \leq x-2 \leq 3 \Rightarrow -1 \leq x \leq 5 \\ \sqrt{3-|x-2|}-1 \neq 0 \rightarrow \sqrt{3-|x-2|} \neq 1 \xrightarrow{\text{مربع}} 3-|x-2| \neq 1 \end{cases}$

$\rightarrow |x-2| \neq 2 \Rightarrow x \neq 4 \vee x \neq 0 \Rightarrow Dg = [2, 5] - \{3, 0\} = [2, 3) \cup (3, 5] \cup (0, 2)$

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

ب) $y = \frac{\cos x}{\sqrt{\cos x} - 1} \rightarrow \sqrt{\cos x} - 1 \neq 0 \rightarrow \sqrt{\cos x} \neq 1 \Rightarrow \cos x \neq 1 \Rightarrow$

$D_y = \mathbb{R} - \left\{ x \mid x = 2k\pi, k \in \mathbb{Z} \right\}$

الف) $y = \frac{x+3}{|2x+1| - |x+3|} \rightarrow |2x+1| - |x+3| \neq 0 \rightarrow |2x+1| \neq |x+3| \xrightarrow{\text{مربع}} (x+3)^2 \neq (2x+1)^2$

$\rightarrow (2x+1)^2 - (x+3)^2 \neq 0 \xrightarrow{\text{تفاوت مربع}} (2x+1+x+3)(2x+1-x-3) \neq 0 \rightarrow (3x+4)(x-2) \neq 0$

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

ب) $y = \sqrt{|2x+1| - |x+3|} \rightarrow |2x+1| - |x+3| \geq 0 \rightarrow |2x+1| \geq |x+3| \xrightarrow{\text{مربع}} (x+3)^2 \leq (2x+1)^2$

$\rightarrow (2x+1)^2 - (x+3)^2 \geq 0 \xrightarrow{\text{تفاوت مربع}} (x-2)(3x+4) \geq 0 \xrightarrow{\text{جدول علامت}} D_y = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$

$f(x) = \sqrt{\log_{0.5}(\log_{0.5}(2x-1))}$

$\rightarrow \begin{cases} \log_{0.5}(2x-1) \geq 0 \rightarrow 2x-1 \leq 1 \rightarrow 2x \leq 2 \Rightarrow x \leq 1 \\ \log_{0.5}(\log_{0.5}(2x-1)) \geq 0 \rightarrow \log_{0.5}(2x-1) \leq 1 \rightarrow 2x-1 \leq 2 \Rightarrow x \leq 1.5 \end{cases}$

$\rightarrow 2x-1 \leq 1 \rightarrow 2x \leq 2 \rightarrow x \leq 1 \Rightarrow Df = (-1, 1]$

الف) $y = \log(\sqrt{\cos x} + 1) \rightarrow \sqrt{\cos x} + 1 > 0 \rightarrow \sqrt{\cos x} > -1 \rightarrow \cos x > -1 \Rightarrow -\frac{\pi}{2} < x < \frac{\pi}{2}$

$\Rightarrow D_y = (2k\pi - \frac{\pi}{2}, 2k\pi + \frac{\pi}{2})$

ب) $y = \sqrt{\log \frac{x-1}{x+1}}$

$\rightarrow \begin{cases} \log \frac{x-1}{x+1} \geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1}{x+1} - 1 \geq 0 \rightarrow \frac{x-1-x-1}{x+1} \geq 0 \rightarrow \frac{-2}{x+1} \geq 0 \rightarrow x < -1 \end{cases}$

$\rightarrow \frac{x-1}{x+1} \geq 0 \rightarrow \frac{-2}{x+1} \geq 0 \rightarrow x < -1 \Rightarrow D_y = (-\infty, -1)$