

۲. افین عالی و کم نوشته ۲۰۲۰ - تکلیف ۲

سوال یک $f(x) = \sqrt{(a-2)x^2 + ax + b} \rightarrow [3, +\infty)$

عبارت زیر را کلاً صحتاً نامیده اند (لطفاً پاسخ دهید).
 $(a-2) = 0 \rightarrow a = 2$ $\rightarrow$ فرض

$a = 2$
 $2x + b \geq 0 \rightarrow 2x \geq -b \rightarrow x \geq -\frac{b}{2} \rightarrow [-\frac{b}{2}, +\infty)$
 $\rightarrow -\frac{b}{2} = 3 \rightarrow b = -6$

سوال ۲ $f(x) = \sqrt{x^2 + 2x + 2 - m^2} \rightarrow D_f = R$

$x^2 + 2x + 2 - m^2 \geq 0 \rightarrow (x+1)^2 + 1 - m^2 \geq 0 \rightarrow m^2 \leq 1 \rightarrow -1 \leq m \leq 1$
 ← صفر یا مثبت ← کمترین مقدار برای m باید این باشد
 برانتر صفر باشد $1 - (-1) = 2$

سوال ۳ B (۵) $f(x) = \frac{\sqrt{4-x^2}}{[x] + [-x] + 1}$

$\sqrt{4-x^2} \rightarrow 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2 \rightarrow D_f = [-2, 2]$

$[x] + [-x] + 1 \neq 0$
 اعداد صحیح $\rightarrow$ جواب = 1
 اعداد غیر صحیح $\rightarrow$ جواب = 0
 $D_f = \{x / x \notin \mathbb{Z}\}$
 به ازای اعداد صحیح صفر می شود.
 $\rightarrow \{-2, -1, 0, 1, 2\} \rightarrow$ اعداد صحیح

سوال 84

$$الف) \sqrt{x^3 + 3x^2} \rightarrow x^3 + 3x^2 \geq 0 \rightarrow x^2(x+3) \geq 0$$

$$\rightarrow D_f = [-3, +\infty)$$

$$\begin{array}{c} -3 \quad 0 \\ - \quad + \quad + \end{array}$$

$$ب) y = \sqrt{\frac{(x^2-1)(x^3-3x^2)}{x^3-1}} \rightarrow x^2-1 \begin{array}{c} \nearrow 1 \\ \searrow -1 \end{array} \rightarrow x^3-3x^2 = x^2(x-3) \begin{array}{c} \nearrow 0 \\ \searrow 3 \end{array}$$

$$\neq 0 \leftarrow x^3-1 \rightarrow 1 \rightarrow (x-1)(x^2+x+1)$$

$$\begin{array}{c} -1 \quad 0 \quad 1 \quad 3 \\ + \quad - \quad - \quad - \end{array}$$

$$D_f = (-\infty, -1] \cup [3, +\infty) \cup \{0\}$$

سوال 85

$$الف) y = \sqrt{|x-2|-3} \rightarrow |x-2|-3 \geq 0 \rightarrow |x-2| \geq 3$$

$$\left. \begin{array}{l} x \geq 0 \rightarrow x-2 \geq 3 \rightarrow x \geq 5 \\ x \leq 0 \rightarrow -x+2 \geq 3 \rightarrow x \leq -1 \end{array} \right\} \rightarrow D_f = (-\infty, -1] \cup [5, +\infty)$$

$$ب) y = \sqrt{4-|2-x|} \rightarrow 4-|2-x| \geq 0 \rightarrow |2-x| \leq 4$$

$$\left. \begin{array}{l} 2-x \leq 4 \xrightarrow{x \geq 0} x \geq -2 \\ -2+x \leq 4 \xrightarrow{x \leq 0} x \leq 6 \end{array} \right\} \rightarrow D_f = [-2, 4]$$

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سوال 86

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

$$\begin{array}{l} x \geq 0 \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1 \\ x \leq 0 \rightarrow -x^2 \leq 1 \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1 \end{array}$$

$$\rightarrow [-1, 1] \cap ((-\infty, -1) \cup [1, +\infty))$$

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

دست باز است بر اعداد منفی و دست بسته بر اعداد مثبت

سوال ٦

$$y = \frac{1}{\sqrt{3-|x-5|}-1}$$

$$3-|x-5| \geq 0 \rightarrow |x-5| \leq 3$$

$$\left. \begin{array}{l} x \geq 0 \rightarrow x-5 \leq 3 \rightarrow x \leq 8 \\ x \leq 0 \rightarrow -x+5 \leq 3 \rightarrow x \geq 2 \end{array} \right\} \rightarrow [2, 8]$$

$$\sqrt{3-|x-5|}-1 \neq 0 \rightarrow 3-|x-5| \neq 1 \rightarrow \begin{array}{l} x \geq 0 \rightarrow 3-x+5+1 \rightarrow x \neq 7 \\ x \leq 0 \rightarrow 3+x-5 \neq 1 \rightarrow x \neq 3 \end{array}$$

$$\rightarrow D_f = [2, 8] \setminus \{3, 7\}$$

سوال ٨٧

$$y = \frac{\sin^2 x - 1}{\cos x}$$

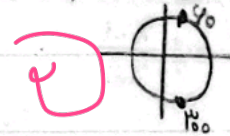
$$\rightarrow \cos x \neq 0$$



$$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2} \right\}$$

$$y = \frac{\cos x}{2\cos x - 1}$$

$$\rightarrow 2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$$



$$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right\}$$

سوال ٨٨

$$y = \frac{x+3}{|2x+1|-|x+3|}$$

$$|2x+1|-|x+3| \neq 0 \rightarrow |2x+1| \neq |x+3|$$

$$\rightarrow 2x+1 \neq x+3 \rightarrow x \neq 2$$

$$\rightarrow 2x+1 \neq -(x+3) \rightarrow 3x \neq -4 \rightarrow x \neq -\frac{4}{3}$$

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

$$y = \sqrt{|2x+1|-|x+3|} \rightarrow |2x+1|-|x+3| \geq 0 \rightarrow |2x+1| \geq |x+3|$$

$$4x^2+1+4x \geq x^2+9+4x \rightarrow 3x^2-8 \geq 0 \rightarrow x \leq -\frac{2}{\sqrt{3}} \text{ or } x \geq \frac{2}{\sqrt{3}}$$

$$(x-2)(x+\frac{4}{3}) \geq 0 \rightarrow D_f = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$$

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

مسال ۹۸ چن پای صراست: سن ۱۰۰

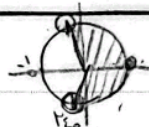
است.

$$2x-1 > 0 \rightarrow x > \frac{1}{2}$$

$$\log_{\frac{1}{\omega}} (2x-1) > 0 \rightarrow 2x-1 > 1 \rightarrow x > 1$$

$$\log_{\frac{1}{\omega}} \log_{\frac{1}{\omega}} (2x-1) \geq 0 \rightarrow \log_{\frac{1}{\omega}} (2x-1) \leq 1 \rightarrow 2x-1 \leq \omega \rightarrow 2x \leq 4 \rightarrow x \leq 2$$

$$\rightarrow D_f = (1, 2]$$



مسال ۹۸

$$y = \log(2\cos x + 1) \rightarrow 2\cos x + 1 > 0 \rightarrow 2\cos x > -1 \rightarrow \cos x > -\frac{1}{2}$$

$$-1 < \cos x \leq 1 \rightarrow \cos x \rightarrow \left(-\frac{1}{2}, 1\right] \rightarrow D_f = \left(-\frac{1}{2}, 1\right]$$

$$D_f = R - \left[2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}\right]$$

$$b) y = \sqrt{\log \frac{x-1}{x+1}} \quad \frac{x-1}{x+1} > 0 \quad \frac{-1}{x+1} + \frac{1}{x-1} \rightarrow (-\infty, -1) \cup [1, +\infty)$$

$$\log_{\frac{1}{10}} \frac{x-1}{x+1} \geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1}{x+1} - 1 \geq 0$$

$$\frac{x-1-x-1}{x+1} \geq 0 \rightarrow \frac{-2}{x+1} \geq 0 \rightarrow \frac{-1}{x+1} \rightarrow (-\infty, -1]$$

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