

۲. آزمون خوب نوشتی

$$f(x) = \sqrt{(a-2)x^2 + ax + b}$$

$$2x + b \rightarrow (3, 0)$$

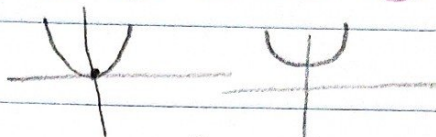
$$a-2=0$$

$$a=2$$

$$5a+b=0 \quad b=-6$$

(۱)

$$f(x) = \sqrt{x^2 + 2x + 2 - m^2}$$



$$\Delta \leq 0$$

$$4 - (4x + 2 - m^2) \geq 0 \Rightarrow 4 - 4 + 4m^2 \geq 0$$

$$1 - m^2$$

$$4m^2 - 4 \leq 0$$

$$4m^2 \leq 4$$

$$m^2 \leq 1$$

$$|m| \leq 1$$

$$-1 \leq m \leq 1$$

(۲)

$$f(x) = \sqrt{4 - x^2} \geq 0 \rightarrow \sqrt{4} \geq x^2 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$$

$$[x] + [-x] + 1$$

$$2 \rightarrow 0$$

$$\neq 2 \rightarrow -1$$

$$-2 = -1 = 0 = 1$$

$$2$$

(۳)

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

$$[-3, +\infty)$$

$$(ب) \sqrt{\frac{(x^2-1)(x^3-3x)}{x^3-1}} \rightarrow \frac{(x+1)(x-1)(x^2(x-3))}{x^3-1}$$

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

$$-1$$



$$\sqrt{|x-2|} = 3 \quad |x-2| \geq 9 \quad x-2 \geq 9 \quad x-2 \leq -9$$

$$(\infty, -1] \cup [5, \infty)$$

$$x \geq 11$$

$$x \leq -7$$

(۵)

$$\sqrt{4 - |2-x|} \quad \text{د} \quad 4 > |2-x| \rightarrow 4 > 2-x > -4 \quad (5)$$

$$2 > -x > -6$$

$$-2 < x < 2$$

$$\text{الف) } \sqrt{1-x|x|} \quad |x| < 1$$

$$x \rightarrow x^2 \rightarrow 1-x^2 \rightarrow 1-x^2 \geq 0 \rightarrow \sqrt{1-x^2}$$

$$x \rightarrow -x^2 \rightarrow 1+x^2 \rightarrow 1+x^2 \geq 0 \rightarrow \sqrt{1+x^2}$$

$$D_f = (-\infty, 1] \quad |x| \geq 1$$

$$1 \geq x \geq -1$$

$$\text{ب) } \frac{1}{\sqrt{3-|x-5|}-1} \rightarrow 3-|x-5| > 0 \quad 3 > |x-5|$$

$$3 > x-5 > -3$$

$$8 > x > 2$$

$$3-|x-5| \neq 1 \quad |x-5| \neq 2 \quad x \neq 7, 3$$

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

$$\text{الف) } \frac{\sin^2 x - 1}{\cos x} \quad \cos R = \left\{ \frac{\pi}{2} + \frac{\pi}{2} \right\} \quad (5)$$

$$(V)$$

$$\text{ب) } \frac{\cos x}{2\cos x - 1} \quad 2\cos x - 1 \neq 0 \quad \cos x \neq \frac{1}{2}$$

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

$$\text{الف) } = \frac{x+3}{|2x+1| - |x+3|} \quad (|2x+1| \neq |x+3|)$$

$$|2x+1| - |x+3| \neq 0 \quad 4x^2 + 5x + 1 \neq x^2 + 6x + 9$$

$$3x^2 - x - 8 \neq 0 \rightarrow x^2 - 2x - 2 \neq 0$$

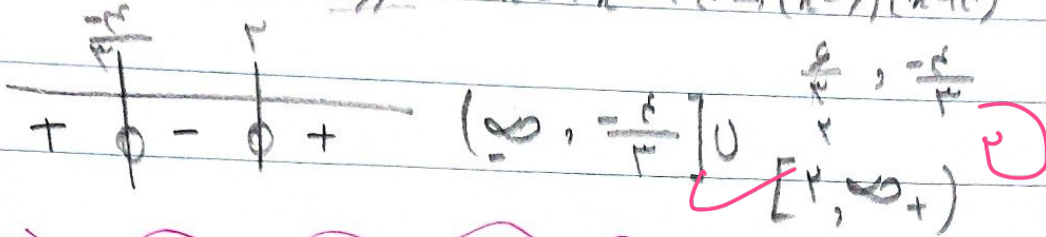
$$R = \left\{ 2 \right\} \cup \left\{ \frac{-1 \pm \sqrt{9}}{2} \right\}$$

$$\log_a x = x \quad x = \frac{1}{a}$$

ب) $|x+1| - |x+3| \geq 0 \quad (x+1)^2 \geq (x+3)^2$ (1)

$$x^2 + 2x + 1 \geq x^2 + 6x + 9$$

$$3x^2 - 4x - 8 \geq 0 \quad x^2 - 2x - 2 \geq 0 \rightarrow (x-4)(x+2)$$



ج) $\log_a (2x-1)$

$$2x-1 > 0$$

$$x > \frac{1}{2}$$

$$\log_a (2x-1) > 0$$

$$x > 1 \leftarrow 2x-1 > 1$$

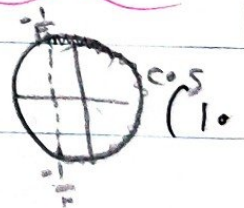
$$\log_a \log_a (2x-1) \geq 0 \rightarrow \log_a (2x-1) \geq 1 \rightarrow 2x-1 \geq a \rightarrow x \geq \frac{a+1}{2}$$

$$x = \left(\frac{a+1}{2}, \infty \right)$$

د) $\log_{10} (2\cos^2 x + 1)$

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

$$\left(\frac{2\pi}{3}, \frac{4\pi}{3} \right)$$



هـ) $\log_{10} \frac{x-1}{x+1}$

$$\frac{x-1}{x+1} > 0$$

$$(-\infty, -1) \cup (1, \infty)$$

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

$$\frac{x-1-x-1}{x+1} \geq 1$$

$$\frac{x-1-x-1}{x+1} \geq 0$$

$$(-\infty, -1)$$