فرناز آقایی — تکلیف ۲ — یازدهم دختر C

1

$2x^2-4x+y^2+6y+k=0 \longrightarrow \underbrace{2x^2-4x+2}_{2(x-1)^2}+\underbrace{y^2+6y+9}_{(y+3)^2}=0 \longrightarrow k=11$

2

$x=a \longrightarrow a^2+4a=2a+a+2 \longrightarrow a^2+a-2=0 \longrightarrow (a+2)(a-1)=0 \longrightarrow a=-2 \;,\; a=1$ پس

① $a=-2 \longrightarrow x^2+4x \quad x\geq -2$; $2x \quad x\leq -2$; $a>0$ ✗ صحیح نیست

② $a=1 \longrightarrow x^2+4x \quad x\geq 1$; $2x+3 \quad x\leq 1$ ✓

$f(1)=1+4=5$

3

$|x+1|\geq 2 \longrightarrow x+1\geq 2 \longrightarrow x\geq 1$

$x+1\leq -2 \longrightarrow x\leq -3 \longrightarrow x=-3 \longrightarrow 18-b=a-6 \longrightarrow a+b=24$

4

$6x-a\geq 0$, $b-3x\geq 0$

این عبارت همیشه منفی است پس باید فقط صفر شود

$x=2$: $b-6=0 \longrightarrow b=6$; $(6\times 2)-a=0 \longrightarrow a=12$

$\longrightarrow \frac{b}{a}=\frac{6}{12}=\frac{1}{2}$

5

(قسمت الف

$\frac{x+1}{|x+3|}\geq 0 \longrightarrow x+1\geq 0 \longrightarrow x\geq -1$ ① — $|x+3|$ همیشه مثبت

$\frac{6-x}{x^2+4x+4}=\frac{6-x}{(x+2)^2}\geq 0 \longrightarrow 6-x\geq 0 \longrightarrow 6\geq x$ ② — $(x+2)^2$ همیشه مثبت

$①,② \xrightarrow{\cap} [-1,6]$

(قسمت ب

$[x]-4\geq 0 \longrightarrow [x]\geq 4 \longrightarrow x\geq 4$

$2-[x]\geq 0 \longrightarrow 2\geq [x] \longrightarrow 3>x$

$D_f=\varnothing$

6

(قسمت الف

$\frac{(x-3)(x+2)}{(x^2-4)(x^2-9)}\geq 0$ — جدول علامت: $-3,\,-2,\,2,\,3$: $+\;-\;-\;+\;+$

$(-\infty,-3)\cup(2,+\infty)-\{3\}$

(قسمت ب

$\frac{(x-1)(x^2-x-6)}{(x+1)(x^2+x-6)}\geq 0$ — جدول علامت: $-3,\,-2,\,-1,\,1,\,2,\,3$: $+\;-\;+\;-\;+\;-\;+$

$(-\infty,-3)\cup[-2,-1)\cup[1,2)\cup[3,+\infty)$

7

قسمت اول) $[-x]-2 \geq 0 \longrightarrow [-x] \geq 2 \longrightarrow -x \geq 2 \longrightarrow x \leq -2$

$(-\infty, -2]$

قسمت ب) $[x]^2 - 2[x] - 3 \neq 0 \longrightarrow ([x]-3)([x]+1) \neq 0$

$[x] \neq 3 \quad [x] \neq -1 \longrightarrow x \neq [3,4) \quad x \neq [-1, 0)$

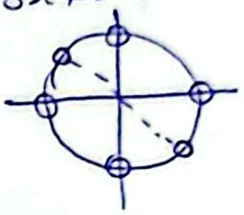
$R - [2,4) \cup [-1, 0)$

8

قسمت اول) $\dfrac{\frac{\cos x}{\sin x}+1}{\frac{\sin x}{\cos x}+1} \longrightarrow \sin x \neq 0 \quad \cos x \neq 0$

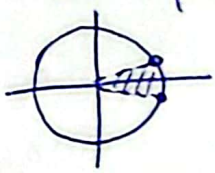
$\frac{\sin x}{\cos x}+1 \neq 0$

$\frac{\sin x}{\cos x} \neq -1$



$R - \left\{ \underbrace{k\pi, k\pi + \frac{\pi}{2}}_{\frac{k\pi}{2}}, k\pi - \frac{\pi}{4} \right\}$

قسمت ب) $1 - 2\sin^2 x \geq 0 \longrightarrow 1 \geq 2\sin^2 x \longrightarrow \frac{1}{2} \geq \sin^2 x \longrightarrow \frac{1}{2} \geq \sin^2 x \geq -\frac{1}{2}$



$\left\{ k\pi \pm \frac{\pi}{6} \right\}$

9

$1 - \log_{\frac{1}{2}}^{x-1} \geq 0 \longrightarrow 1 \geq \log_{\frac{1}{2}}^{x-1}$

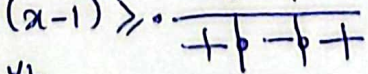
$\longrightarrow x-1 > 0 \longrightarrow x > 1$

$\frac{1}{2} \geq x-1 \longrightarrow \frac{3}{2} \geq x$

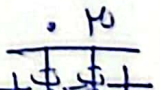
$\left\{ \cap \right. \quad 1 < x \leq \frac{3}{2}$

قسمت الف

قسمت ب $x^2 - x \geq 0 \longrightarrow x(x-1) \geq 0$



$x^2 - 4x > 0 \longrightarrow x(x-4)$

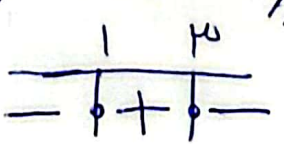


$1 - \log_4^{x^2-4x} \neq 0 \longrightarrow 1 \neq \log_4^{x^2-4x} \longrightarrow x^2 - 3x - 4 \neq 0 \longrightarrow (x-4)(x+1) \neq 0$

$x \neq 4 \quad x \neq -1$

$Df = (-\infty, -1) \cup (-1, 0) \cup (3, 4) \cup (4, +\infty)$

قسمت الف $2^{4x-x^2} - 8 \geq 0 \longrightarrow 2^{4x-x^2} \geq 8 \longrightarrow 4x - x^2 \geq 3$



$-x^2 + 4x - 3 \geq 0$

$[1, 3]$

10

قسمت ب) $\frac{3x+5}{2x+4} \in \omega \longrightarrow 3x+5 \in 2x\omega+4\omega \longrightarrow$ 10

$3x-2x\omega \in -5+4\omega \longrightarrow x(3-2\omega) \in -5+4\omega \longrightarrow \therefore$

$x \in \frac{-5+4\omega}{3-2\omega}$

$\{x \mid x=\frac{-5+4k}{3-2k}, k \in \omega\}$