

$f(x) = 2x^2 - 4x + k$
 $g(y) = -y^2 - 9y$
 $2x^2 - 4x + k = -y^2 - 9y$
 $4 \pm \sqrt{16-4k}$
 $\frac{-b}{2a} = \frac{4}{4} = 1$
 $\min f(x) \leq \max g(y)$
 $k-2 \leq 9$
 $k \leq 11$

$k=10 \rightarrow x=1$
 $k=11$
 در صورت سادگی ذکر شده که رابط
 یک تابع "تانی" باشد پس
 $k=11$

$\begin{cases} x^2 + 4x & x \geq a \\ 2x + a + 2 & x \leq a \end{cases}$
 $a^2 + 4a = 2a + 2 \rightarrow a^2 + 2a - 2 = 0$
 $a = 1$
 $f(1) = 0$

$\begin{cases} 2x^2 - b & |x+1| > 2 \rightarrow x > 1 \\ a + 2x & -2 \leq x \leq -1 \end{cases}$
 $x = -1$
 $1 - b = a + 2 \rightarrow a + b = -1$

$D_f = 2 \rightarrow 4x - a = 0 \rightarrow 12 - a = 0 \rightarrow a = 12$
 $b - 4x = 0 \rightarrow b - 4 = 0 \rightarrow b = 4$
 $\frac{b}{a} = \frac{1}{3}$
 $f(x) = \sqrt{4x-a} + \sqrt{b-2x}$

الف) $\sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+2x+1}} \rightarrow (-\infty, 4]$
 $D_f = [-1, 2) \cup (3, 4]$
 ب) $\sqrt{[x]-4} + \sqrt{2-[x]}$
 $[4, +\infty) \cap (-\infty, 3) = \emptyset$

الف) $\sqrt{\frac{x^2 - x - 6}{x^2 - 11x + 18}} \rightarrow \Delta = 25 \rightarrow \pm 5$
 $D_f = (-\infty, -2) \cup (3, +\infty)$

$\frac{-1 \pm \sqrt{1+4}}{2} = \frac{-1 \pm 5}{2}$
 $D_f = (-\infty, -2) \cup (3, +\infty)$

ب) $\sqrt{\frac{x^2 - 2x^2 - 2x + 4}{x^2 + 2x^2 - 2x - 4}} = \sqrt{\frac{(x-1)(x^2 - x - 4)}{(x+1)(x^2 + x - 4)}}$
 $D_f = (-\infty, -1) \cup [1, 2) \cup (2, +\infty)$

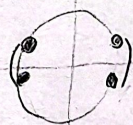
$\frac{-1 \pm \sqrt{1+4}}{2} = \frac{-1 \pm 5}{2}$
 $D_f = (-\infty, -1) \cup [1, 2) \cup (2, +\infty)$

الف) $\sqrt{-x} - 2 \quad D_f = (-\infty, -4]$

ب) $[x]^2 - 2[x] - 3 \neq 0$
 $[x] \neq -1 \rightarrow (-\infty, -1) \cup [0, +\infty)$
 $[x] \neq 3 \rightarrow (-\infty, 3) \cup [4, +\infty)$
 $D_f = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$

الف) $\cos x + 1 \rightarrow \sin x \neq 0 \rightarrow R - k\pi$
 $\cos x \neq 0 \rightarrow k\pi + \frac{\pi}{2}$
 $\sin x \neq \cos x \rightarrow k\pi + \frac{\pi}{4}$

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



ب) $\sin^2 x \leq 1 \rightarrow \sin x \leq \frac{1}{2} \rightarrow |\sin x| \leq \frac{1}{2}$

$D_f = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right]$
 $k \in \mathbb{Z}$

الف) $x-1 > 0 \rightarrow x > 1$

ب) $\log_{\frac{1}{2}}(x-1) \leq 1 \rightarrow x-1 \geq \frac{1}{2} \rightarrow x \geq \frac{3}{2}$
 $D_f = \left[\frac{3}{2}, +\infty \right)$

ب) $x^2 - x > 0 \rightarrow (-\infty, 0] \cup [1, +\infty)$
 $x^2 - 3x > 0 \rightarrow (-\infty, 0) \cup (3, +\infty)$
 $x^2 - 3x - 4 \neq 0 \quad x \neq -1, 4$
 $D_f = (-\infty, -1) \cup (0, 1) \cup (3, 4) \cup (4, +\infty)$

الف) $\sqrt{x-x^2} \geq 1 \rightarrow x-x^2 \geq 0 \rightarrow D_f = [1, 2]$

ب) $\frac{x^2 + a}{x^2 + b} \in \mathbb{Z} \rightarrow x \in \frac{a - bk}{b - k} \rightarrow D_f = \left\{ x/x = \frac{a - bk}{b - k}, k \in \mathbb{N} \right\}$