

$$2x^2 - 4x + y^2 + 4y + 1 = k$$

$$2x^2 - 4x = 2(x^2 - 2x) = 2[(x-1)^2 - 1] = 2(x-1)^2 - 2$$

$$y^2 + 4y = (y+2)^2 - 4$$

$$2(x-1)^2 - 2 + (y+2)^2 - 4 + k = 2(x-1)^2 + (y+2)^2 + (k-11)$$

$$\boxed{k=11}$$

$$a^2 + 4a = 2a + 2 \rightarrow a^2 + a - 2 = 0 \rightarrow \begin{cases} a = -2 \times \\ a = 1 \checkmark \end{cases}$$

$$f(1) = 1 + 1 = 2$$

فرض در شرط اول طبق قیاس در شرط دوم $x = -3$ تعیین

$$f(x) = \begin{cases} 2x^2 - b & ; |x+1| \geq 2 \\ a + 2x & ; -2 \leq x \leq -1 \end{cases} \quad \begin{cases} 18 - b = a - 6 \rightarrow \boxed{a+b=24} \end{cases}$$

$$4x - a \geq 0 \rightarrow 4x \geq a \rightarrow x \geq \frac{a}{4} \rightarrow \frac{a}{4} = 2 \rightarrow \boxed{a=8}$$

$$b - 2x \geq 0 \rightarrow b \geq 2x \rightarrow \frac{b}{2} \geq x \rightarrow \frac{b}{2} = 2 \rightarrow \boxed{b=4}$$

$$\frac{b}{a} = \frac{4}{8} = \boxed{\frac{1}{2}}$$

الف) $\frac{x+1}{|x-2|} \geq 0$

-	+	+
---	---	---

$x \geq -1 \cap x \leq 2 \rightarrow \boxed{-1 \leq x \leq 2}$

$\frac{4-2x}{x^2+2x+1} \geq 0 \cap x \leq 2$

+	+	-
---	---	---

$\cap \rightarrow 1 \leq x \leq 2$

ب) $[x] - 4 \geq 0 \rightarrow [x] \geq 4 \rightarrow \boxed{x \geq 4}$

$2 - [x] \geq 0 \rightarrow 2 \geq [x] \rightarrow 2 \geq x$

$\cap \rightarrow 1 \leq x \leq 2$

الف) $\frac{x^r - x - \gamma}{x^r - 1^r x^r + \gamma} \geq 0 \rightarrow (x^r - \gamma)(x^r - \epsilon)$

Sign chart: $\begin{array}{c|cccc} & -1 & -1 & 1 & 1 \\ \hline & + & - & - & + & + \\ \hline & & & & & (r, +\infty) \cup (-\infty, -r) \end{array}$

$x^r - 2x^r - \alpha x + \gamma \frac{x-1}{x^r - x + \gamma} \geq 0$

$x^r + 2x^r - \alpha x - \gamma \frac{x+1}{x^r + x - \gamma} \geq 0$

Sign chart: $\begin{array}{c|cccccc} & -r & -r & -1 & 1 & 1 & r \\ \hline & + & - & - & - & + & - \\ \hline & & & & & & (r, +\infty) \cup [1, r) \cup (-r, -1) \cup (-\infty, -r) \end{array}$

الف) $[-x] - r \geq 0 \quad [-x] \geq r \rightarrow (-\infty, -r]$

Y

$\hookrightarrow \frac{\alpha x^r + \gamma}{(x)^r - r(x) - r} \quad R = \{[-1, 0) \cup [r, \epsilon)\}$

الف) $\frac{\frac{\cos x + 1}{\sin x}}{\frac{\sin x}{\cos x + 1}} \quad \left\{ \begin{array}{l} \tan x \neq -1 \\ \sin x \neq 0 \\ \cos x \neq 0 \end{array} \right\} \quad R = \left\{ 2k\pi + \frac{r\pi}{r}, 2k\pi + \frac{\pi}{r}, k\pi, 2k\pi + \frac{\pi}{r} \right\}$

A

$\hookrightarrow 1 - \epsilon \sin^r x \geq 0 \rightarrow \frac{1}{\epsilon} \geq \sin^r x \rightarrow \frac{1}{\epsilon} \geq \sin x \quad \left[2k\pi + \frac{\pi}{\epsilon}, 2k\pi \right] \cup \left[2k\pi + \frac{\pi}{\epsilon}, k\pi \right]$

الف) $1 - \log \frac{x-1}{r} \geq 0 \quad x-1 > 0 \rightarrow x > 1$

$1 \geq \log \frac{x-1}{r} \quad x-1 \leq \frac{1}{r} \quad x \leq \frac{r}{r}$

$x > 1 \cap x \leq r \rightarrow (1, \frac{r}{r}]$

Sign chart: $\begin{array}{c|cc} & 1 & r \\ \hline & + & - \\ \hline & & (r, +\infty) \cup (-\infty, 0) \end{array}$

9

$x^r - x \geq 0 \rightarrow x(x-1) \geq 0$

Sign chart: $\begin{array}{c|cc} & 1 & r \\ \hline & + & - \\ \hline & & (r, +\infty) \cup (-\infty, 0) \end{array}$

$1 - \log \frac{x^r - rx}{r} \geq 0 \quad x^r - rx \geq 0 \quad x(x-r) \geq 0$

Sign chart: $\begin{array}{c|cc} & 1 & r \\ \hline & + & - \\ \hline & & (r, +\infty) \cup (-\infty, 0) \end{array}$

الف) $\epsilon x - x^r \geq r \rightarrow -x^r + \epsilon x - r \geq 0$

Sign chart: $\begin{array}{c|cc} & -1 & r \\ \hline & - & + \\ \hline & & [-1, -r] \end{array}$

$\hookrightarrow \frac{rx + \alpha}{rx + \epsilon} \in W \quad rxw + \epsilon w = rx + \alpha \rightarrow rx - rxw = \epsilon w - \alpha$

$x = \frac{\epsilon w - \alpha}{r - rx}$

$\left\{ x \mid x = \frac{\epsilon k - \alpha}{r - rx}, k \in W \right\}$

1.