

صورت x^2 و x^2 با هم صفر نشود تا تابع ثابت نباشد. $x^2 + 1 + 2x + 9x^2 + 1 - 6x + mx^2 + nx + mn = f(x)$

$10x^2 - 4x + 2 + mx^2 + nx + mn \Rightarrow m = -10 \quad n = 4 \quad f(x) = -2x$

$g(x) = \{(x, -10), (x, p+1), (-9, -1), (-9, p+k)\}$

$m + n + p + k =$

$p+1 = -10 \rightarrow p = -11$

$p+k = 1 \Rightarrow k = 12$

$-10 + 4 - 11 + 12 = -5$

(c) $\frac{x^2 - 2}{x^2 - 2x - 1} \geq 0$

$(t-2)(t+1) \leq t^2 - 2t - 1 = 0$

$x^2 = 4 \rightarrow x = \pm 2$

$D_f = (-2, 2) - \{+2\}$

استاره منفرجه را قسمن علامت می کنیم:

$x-2$	$-$	$+$	$+$
x^2-2x-1	$+$	$-$	$+$
	$-$	$+$	$+$

صورت x^2 و x^2 با هم صفر نباشد: $x^2 - 2[-x] = 0 \Rightarrow x = 2[-x] \Rightarrow [-x] = 2 \rightarrow (-3, -2)$

$D_f = \mathbb{R} - (-3, -2)$

(الف) $x(x^2 - 1) \geq 0$

x	$-$	0	$+$	$+$
$x^2 + 1$	$+$	$+$	$+$	$+$
	$-$	$+$	$+$	$+$

نقطه اول: $[-1, 0] \cup [1, +\infty)$

نقطه دوم: $|x| + x > 0 \rightarrow |x| > -x \rightarrow (0, +\infty)$ استاره ۲ سطر ۱

$D_f = [1, +\infty)$

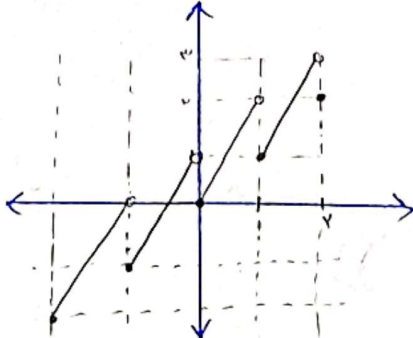
(ب) $|x-2| - x^2 \geq 0 \rightarrow |x-2| \geq x^2$ $x \neq \pm 1$ $|x-1| \neq 0$ $|x| + x > 0 \rightarrow |x| > -x \rightarrow (0, +\infty)$ استاره ۲ سطر ۱

صورت x^2 و x^2 با هم صفر نباشد: $|x-2| - 1 = k \rightarrow |x-2| = k+1$

$|x-2| = k+1 \rightarrow x = k+3$ $|x-2| = -k+1 \rightarrow x = 1-k$

$|x-2| = -k+1 \rightarrow x = -k+3$ $|x-2| = k-1 \rightarrow x = k-1$

$x-2 = k+1 = 0 \rightarrow k = -1$ $x-2 = -k+1 = 0 \rightarrow k = 1$



$[x] - 2x$ چگون در بار: $[x] - 2x$

$x + x - [x] \leftarrow [1, 2)$

$x - 2x - [x] \leftarrow [0, 1)$

$x + 1 - 2x - [x] \leftarrow [-1, 0)$

$x + 2 - 2x - [x] \leftarrow [-2, -1)$

$$\frac{x^r - \varepsilon x + r}{x+a} + b = y \rightarrow \frac{(x-1)(x+r)}{x+a} + b = y$$

$$x=y \leftarrow \text{بعض حالات}$$

$$x-1, x+a \rightarrow a=+1 \Rightarrow (x-r)+b=y \rightarrow b=r \rightarrow a-b, -1-r: \boxed{-\varepsilon}$$

$$x-r, x+a \rightarrow a=-r \Rightarrow x-1+b=y \rightarrow \boxed{b=1} \rightarrow a-b = -r-1 = \boxed{-\varepsilon}$$

$(-\varepsilon) \leftarrow \text{كثيرا، كثيرا}$

$$\frac{x^r + r x^r - x \cdot r}{x^r - 1} = \frac{(x^r - 1)(x+r)}{x^r - 1} \rightarrow x+r = g(x) = x+C \rightarrow \boxed{C=r}$$

$$g(x), x+r \xrightarrow{+1} r \rightarrow f(x) \xrightarrow{+1} \frac{a+r}{1+b}, r \Rightarrow x+r = r+b$$

$$b+C = \frac{1}{r} + r, \left(\frac{a}{r}\right) \quad \quad \quad a = r, b = \frac{1}{r} \quad \quad \quad b = \frac{1}{r} \quad \quad \quad r x = x + \varepsilon b$$

$$D_f: \varepsilon x - r a > 0 \rightarrow x > \frac{r}{\varepsilon} a$$

$$D_f \cap D_g = \{1\} \quad \quad \quad \frac{r}{\varepsilon} a < 1 \rightarrow \boxed{a < \frac{\varepsilon}{r}}$$

$$\frac{b}{\varepsilon} < 1 \rightarrow \boxed{b < \varepsilon}$$

$$D_g: b - \varepsilon x > 0 \rightarrow \frac{b}{\varepsilon} > x$$

$$f-g, \sqrt{\varepsilon x - \varepsilon} - \sqrt{\varepsilon - \varepsilon x} \xrightarrow{-k} -\sqrt{k} \leq k$$

$$-r = rk \rightarrow \boxed{k=1}$$

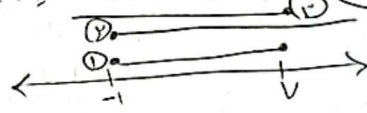
$$ra - \frac{b}{r} - k = r\left(\frac{\varepsilon}{r}\right) - \frac{1}{r} - (-1) = \boxed{r}$$

$$D_{f,g} = [-1, v] = D_g \cap D_f$$

$$D_g: rx + r > 0 \rightarrow rx > -r \rightarrow \boxed{x > -1}$$

$$D_f: (-\infty, v] \rightarrow m - x > 0 \rightarrow m > x$$

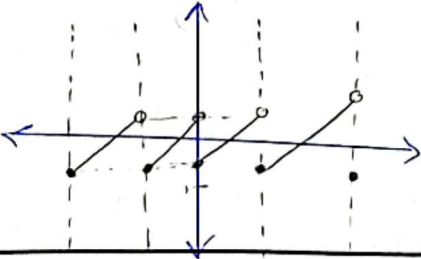
$m = v$



$$f(r) - g(r) = 4\sqrt{r} \xrightarrow{+h} \sqrt{\varepsilon} + h - \sqrt{r} = 4\sqrt{r} \quad \quad \quad \boxed{h = \sqrt{\varepsilon} - r}$$

$$m+h = \sqrt{\varepsilon} - r + v = \boxed{\sqrt{\varepsilon} + v}$$

$$y = x - [x] = \frac{1}{r} \Rightarrow y = x - [x] - \frac{1}{r}$$



$$x-1-\frac{1}{r}, x-\frac{r}{r} \leftarrow [0, r)$$

$$x-\frac{1}{r} \leftarrow [0, 1)$$

$$x+\frac{1}{r} \leftarrow [-1, 0)$$

$$x+\frac{r}{r} \leftarrow [r, -1)$$

$\boxed{[-\frac{1}{r}, \frac{1}{r}]}$