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$$f(x) = x^2 + 2x + 1 + 9x^2 - 4x + 1 + mx^2 + nx + mn = (1+9+m)x^2 + (2+n-4)x + 2 = 10 + m = 0 \rightarrow m = -10 \quad / \quad -6 + n = 0 \rightarrow n = 6$$

$$g(x) = \left\{ (x, x), (x, x+1), (x+1, x), (x+1, x+k) \right\} \quad m+n+p+k = -1$$

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$$p+1 = -1 \rightarrow p = -2 \quad p+k = -1 \rightarrow -2+k = -1 \quad k = 1$$

$$f(x) = \frac{x-2}{x^2-2x-1} \quad x^2-2x-1 \neq 0 \quad x^2-2x-1 = 0 \quad (x-2)(x+2) < 0 \quad x < -2 \rightarrow x^2-2x-1 > 0 \quad x > 2 \rightarrow x^2-2x-1 > 0$$

$$D = (-2, 2) \cup (2, +\infty)$$

$$f(x) = \frac{x^2+1}{x^2-2x-1} \quad x^2-2x-1 \neq 0 \quad x^2-2x-1 = 0 \quad x < -2 \rightarrow x^2-2x-1 > 0 \quad x > 2 \rightarrow x^2-2x-1 > 0$$

$$D = (-\infty, -2) \cup (2, +\infty)$$

$$f(x) = \frac{x(x^2-1)}{|x|+x} \quad x(x^2-1) \neq 0 \quad x \neq 0, \pm 1 \quad x \in [-1, 0] \cup [1, +\infty)$$

$$|x|+x > 0 \quad x > 0 \quad x < 0 \quad x > 0 \quad x < 0 \quad x > 0 \quad x < 0 \quad x > 0 \quad x < 0$$

$$f(x) = \frac{|x-2|-x^2}{|x|-1} \quad |x|-1 \neq 0 \quad |x| \neq 1 \quad x \neq \pm 1$$

$$x > 2 \quad x-2-x^2 > 0 \quad x = \frac{-1 \pm \sqrt{1-4(-1)(-2)}}{2(-1)} \quad x < 0 \quad x$$

$$x < 2 \quad 2-x-x^2 > 0 \quad x = \frac{1 \pm \sqrt{1-4(-1)(2)}}{2(-1)} = \frac{1 \pm 3}{-2} \quad x = -1 \quad x = 2$$

$$I \cap II = \{-2, 1\} - \{-1\} \quad \{-2, 1\} \subset \mathbb{R}$$

$$||x-2|-1| = k \neq 0 \quad x-2=1 \rightarrow x=3 \quad k=0 \quad x=0 \quad k=0$$

$$||x-2|-1| = k \quad -k < |x-2|-1 < k \rightarrow -k+1 < |x-2| < k+1$$

Handwritten notes and signatures.

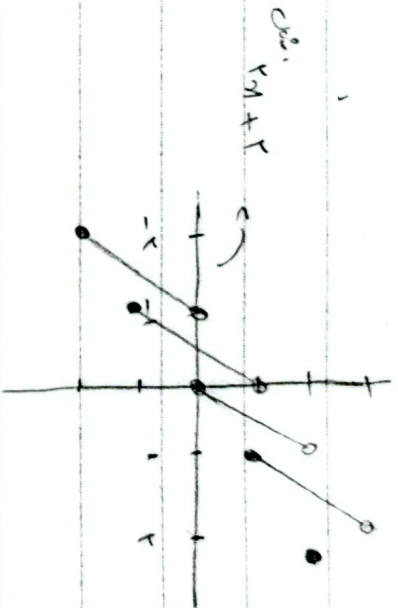
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$$y = r_n - [a] \quad [-r, r]$$

(a)



$$f(n) = \frac{r_n - \varepsilon_n + r}{n+a} \quad \text{if } n \geq \frac{r}{a} + b \quad \frac{r}{a} - b \rightarrow a b - r \quad (c)$$

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$$a - b = -r - 1 = -\frac{r}{a}$$

$$\xrightarrow{a=1} \frac{1 - \frac{r}{a} + r}{1+a} + b = 1 \rightarrow a b = 1 \rightarrow a b = -r$$

$\rightarrow a b = -r$

$$\frac{r_n + r_n - n - r}{r_n - 1} = r + n =$$

(v)

$$n = 18 \quad \frac{a+r}{b+1} = r \rightarrow r b + 1 = a$$

$$b+1$$

$$\rightarrow a = \frac{a}{r} + b + \frac{1}{r} \quad c + b = r + \frac{1}{r} = \frac{a}{r}$$

$$n = 12 \quad \frac{a+r}{b-1} = 1 \rightarrow b - r = a$$

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