

Subject: یازدهم ریاضی ۱

زهرا آثانی

Year. Month. Date. ()

$$\frac{1}{n-1} = -n+1 \quad \frac{1}{n-1} = n-1 \quad (1)$$

$$-n^2 + 2n - 2 = 0 \quad n^2 - 2n + 1 = 1$$

$$\Delta < 0 \quad n^2 - 2n = 0$$

ریشه ندارد $n = 0$ X
 $n = 2$ ✓

$$\text{الف) } \left| \frac{2n-1}{n} \right| < 2 \quad |2n-1| < 2|n| \quad (2)$$

$$(2n-1)^2 < 4n^2$$

$$\left(\frac{1}{2}, +\infty \right) \quad 4n^2 - 4n + 1 < 4n^2$$

$$\leftarrow -4n + 1 < 0 \rightarrow n > \frac{1}{4} \quad n \neq 0$$

$$\text{ب) } \left| \frac{n-2}{2n+1} \right| > 1 \quad |n-2| > |2n+1|$$

$$(n-2)^2 > (2n+1)^2$$

$$n^2 - 4n + 4 > 4n^2 + 4n + 1$$

$$2n+1=0 \quad n \neq -\frac{1}{2} \quad 3n^2 + 8n - 3 < 0 \rightarrow n = \frac{-8 \pm \sqrt{64+36}}{6}$$

$$(-3, -\frac{1}{3}) \cup (-\frac{1}{3}, \frac{1}{3})$$

$$|n-2| < 3 \quad (3)$$

$$n+2 > n^2 \rightarrow n^2 - n - 2 < 0 \rightarrow n = 2, n = -1$$

$$n+2 < -n^2 \rightarrow n^2 + n + 2 < 0 \rightarrow \Delta < 0 \quad \text{ریشه ندارد}$$

نتیجه $-2 < n < 2$

$$-\frac{2}{3} < n - \frac{1}{3} < \frac{2}{3} \rightarrow \left| n - \frac{1}{3} \right| < \frac{2}{3}$$

$$\boxed{n = \frac{1}{3}}$$

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$$y = |x+1| - |x| + |x-2| \quad \text{max, min}$$

(ع)

$$x < -1 \rightarrow y = -(x+1) - x - (x-2) = -1 \quad x = -1$$

$$-1 < x < 0 \rightarrow y = (x+1) - x - (x-2) = 2 \quad x = 0$$

$$0 < x < 2 \rightarrow y = (x+1) - x - (x-2) = -x+3 \quad x = 2$$

$$x > 2 \rightarrow y = (x+1) - x + (x-2) = -1 \quad x = 2$$

$$\text{max} + \text{min} = 2 - 1 = 1$$

$$y = \left| \frac{x}{x} \right| - x \rightarrow y = \left| \frac{x+\epsilon}{x} \right| - x \quad (\omega)$$

$$\left| \frac{x}{x} \right| = \left| \frac{x+\epsilon}{x} \right| + 1 \Rightarrow |x| = |x+\epsilon| + 1 \quad x \geq 0$$

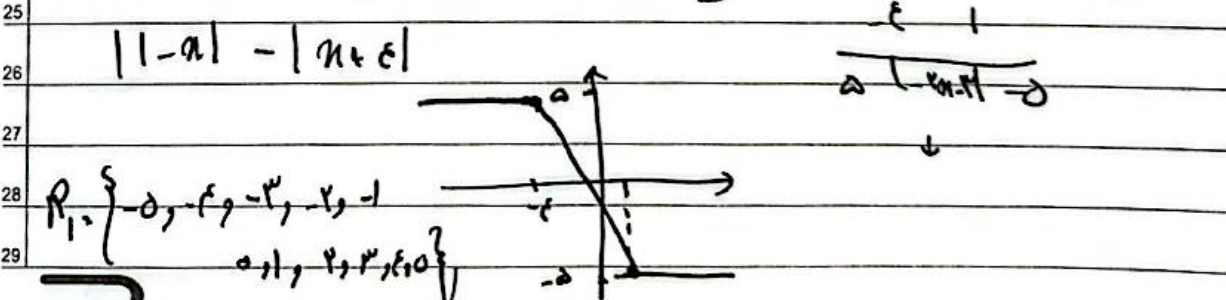
$$x = x + \epsilon \rightarrow 0 = \epsilon \quad \times$$

$$-\epsilon \leq x < 0 \rightarrow -x = x + \epsilon + x = x = -x \quad \checkmark$$

$$x < -\epsilon \rightarrow -x = -(x + \epsilon) + x \Rightarrow 0 = -\epsilon \quad \times$$

$$\boxed{x = -x}$$

$$\text{الف) } f(x) = [|1-x| - |x+\epsilon|] \quad (\gamma)$$



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$$1) f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right] \quad (y)$$

$$\frac{1}{x} - \left[1 + \frac{1}{x} \right] \Rightarrow \frac{1}{x} - \underbrace{\left[\frac{1}{x} \right]}_{[0,1)} \cdot 1 \quad R_f = [-1, 0)$$

$$2) y = [-x] - 1 \quad x \in (-1, 1) \quad (v)$$

$$-1 < x \leq -\frac{1}{2} \rightarrow y = 1 - 1 = 0$$

$$-\frac{1}{2} < x \leq 0 \rightarrow y = 0 - 1 = -1$$

$$0 < x \leq \frac{1}{2} \rightarrow y = -1 - 1 = -2$$

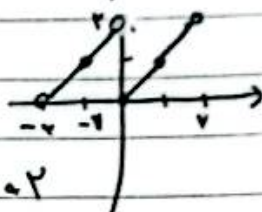
$$\frac{1}{2} < x < 1 \rightarrow y = -2 - 1 = -3$$



$$3) y = x - \left[\frac{x}{2} \right]$$

$$-2 \leq x < 0 \rightarrow y = x - \left[-1 \right] = x + 1$$

$$0 \leq x < 2 \rightarrow y = x - \left[0 \right] = x$$



$$4) y = [|x| - 1] \quad x \in [-2, 2]$$

$$x = -2 \rightarrow y = 1$$

$$-2 < x \leq -1 \rightarrow y = 0$$

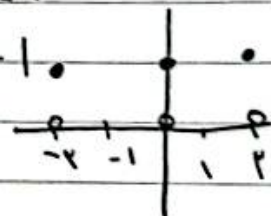
$$-1 < x < 0 \Rightarrow y = 0$$

$$x = 0 \Rightarrow y = 1$$

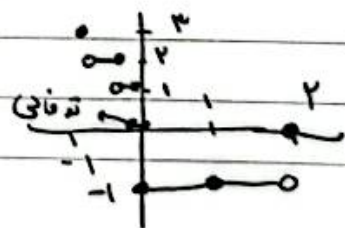
$$0 < x \leq 1 \rightarrow y = 0$$

$$1 \leq x < 2 \rightarrow y = 0$$

$$x = 2 \rightarrow y = 1$$



$$5) y = [x^2 - x] \quad x \in [-1, 2]$$



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$$1 \quad a + [b] = \epsilon/4 \quad a = \epsilon/4 - [b] \quad (4)$$

$$2 \quad b - [a] = 4/\epsilon \rightarrow b = 4/\epsilon + [a] \quad b = 4/\epsilon + [\epsilon/4 - [b]]$$

$$3 \quad a = 1/4 \quad b = 3/4 \rightarrow a + b = 1/4 + 3/4 = \epsilon/4$$

$$4 \quad (1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 194 \quad (10)$$

$$5 \quad (1 + \sqrt{2})^4 = [194 - (1 - \sqrt{2})^4] = [194 - 0.1...] = 194$$