

یا از هم دور می

تکین شماره

۲۰

حزب بازر

سین

$$\frac{1}{n-1} = |n-1| \text{ if } n > 1 \rightarrow \frac{1}{n-1} < n-1 \rightarrow n^2 - 2n + 1 = 1$$

$$n^2 - 2n = 0 \rightarrow n = 0 \text{ or } n = 2$$

$$n = 2 \checkmark$$

$$\text{if } n < 1, \frac{1}{n-1} = -n+1 \rightarrow -n^2 + 2n - 2 = 0 \rightarrow \Delta < 0 \rightarrow \text{no real roots}$$

فقط یک ریشه دارد $n = 2$

$$\text{a) } \left| \frac{2n-1}{n} \right| < 2 \rightarrow |2n-1| < 2|n| \rightarrow (2n-1)^2 < 4n^2$$

$$\rightarrow 4n^2 - 4n + 1 < 4n^2 \rightarrow -4n + 1 < 0 \rightarrow n > \frac{1}{4}, n \neq 0 \rightarrow \left(\frac{1}{4}, +\infty \right)$$

$$\text{b) } \left| \frac{n-2}{2n+1} \right| > 1 \rightarrow |n-2| > |2n+1| \rightarrow (n-2)^2 > (2n+1)^2$$

$$\rightarrow n^2 - 4n + 4 > 4n^2 + 4n + 1 \rightarrow 3n^2 + 8n - 3 < 0 \rightarrow n = \frac{-8 \pm \sqrt{64 + 36}}{6} = \frac{-8 \pm 10}{6}$$

$$2n+1 \neq 0 \rightarrow n \neq -\frac{1}{2}$$

$$\text{solution set} \rightarrow \left(-\infty, -\frac{1}{2} \right) \cup \left(-\frac{1}{2}, \frac{1}{3} \right)$$

$$\frac{-8}{6} \quad \frac{2}{6}$$

$$|2n+1| > n^2 \rightarrow n^2 < 2n+1 \rightarrow n^2 - 2n - 1 < 0 \rightarrow n = \frac{2 \pm \sqrt{4 + 4}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2}$$

$$(-1-\sqrt{2}, 1+\sqrt{2})$$

$$\rightarrow n+1 < -n^2 \rightarrow \underbrace{n^2 + n + 1}_{\text{always positive}} < 0 \rightarrow \Delta < 0 \rightarrow \text{no real roots}$$

$$-1 < n < 1 \quad \frac{-1}{1} < n - \frac{1}{1} < \frac{1}{1} \rightarrow \left| n - \frac{1}{1} \right| < \frac{1}{1} \Rightarrow \boxed{\alpha = \frac{1}{1}}$$

$$n < -1 \rightarrow y = -(n+1) + 1n - (n-1) = 1 \rightarrow n = -1 \rightarrow y = -1 + 1 = 0 \quad (5)$$

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

$$0 < n < 1 \rightarrow y = (n+1) - 1n - (n-1) = -1n + 1 \rightarrow n = 1 \rightarrow y = -1 + 1 = 0$$

$$n > 1 \rightarrow y = (n+1) - 1n + (n-1) = 1$$

$$\min + \max = -1 + 1 = 0$$

$$y = \left| \frac{n}{r} \right| - 1 \rightarrow y = \left| \frac{n+\varepsilon}{r} \right| - 1 \rightarrow \left| \frac{n}{r} \right| - 1 = \left| \frac{n+\varepsilon}{r} \right| - 1 \quad (6)$$

$$\rightarrow \left| \frac{n}{r} \right| = \left| \frac{n+\varepsilon}{r} \right| + 1 \rightarrow |n| = |n+\varepsilon| + 1$$

$$n \geq 0 \rightarrow n = n + \varepsilon + 1 \rightarrow 0 = \varepsilon \quad \text{فقط } \varepsilon$$

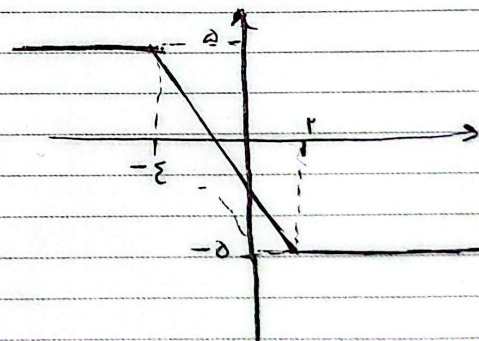
$$n < -\varepsilon \rightarrow -n = -(n+\varepsilon) + 1 \rightarrow 0 = -\varepsilon \quad \text{فقط } \varepsilon$$

$$-\varepsilon < n < 0 \rightarrow -n = n + \varepsilon + 1 \rightarrow \boxed{n = -\varepsilon}$$

$$\text{الف) } [1 - |n| - |n+\varepsilon|]$$

	$-\varepsilon$	1
$1 - n + n + \varepsilon$	$1 - n - n - \varepsilon$	$n - 1 - n - \varepsilon$
a	$-1n - \varepsilon$	$-a$

n	1	$-\varepsilon$	$-a$	r
y	$-a$	a	a	$-a$



$$R = \{-a, -\varepsilon, -\varepsilon, -1, 0, 1, 1, \varepsilon, \varepsilon, a\}$$

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

$$\frac{1}{x} - \left[1 + \frac{1}{x} \right] \rightarrow \frac{1}{x} - \underbrace{\left[\frac{1}{x} \right]}_{[0,1]} - 1 \rightarrow R = [-1, 0)$$

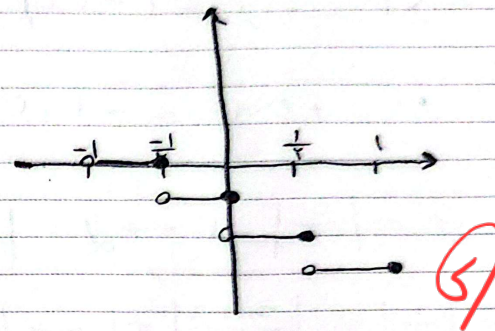
$$\text{الف) } [-2x] - 1 \quad x \in (-1, 1)$$

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

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

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

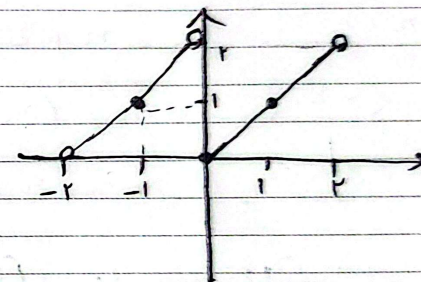
$$\frac{1}{2} < x < 1 \rightarrow y = -2 - 1 = -3$$



$$\text{ب) } y = x - 2 \left[\frac{x}{2} \right] \quad x \in (-2, 2)$$

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

$$0 \leq x < 2 \rightarrow y = x - 2(0) = x$$



$$\text{الف) } [|x| - 1]$$

$$x \in [-2, 2]$$

$$\text{ب) } y = [x^2 - 2x] \quad x \in [-1, 2] \quad \text{①}$$

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

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

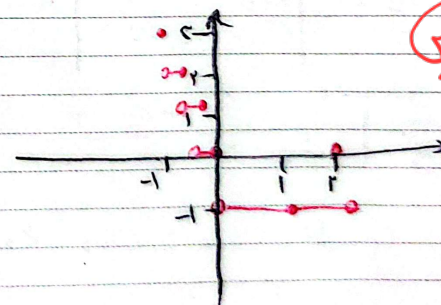
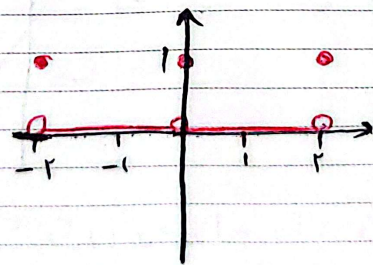
$$-1 < x < 0 \rightarrow y = 0$$

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

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

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

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



$$a + (b - 0.1\varepsilon) = \varepsilon/2$$

$$b - (a - 0.1r) = r/8$$

$$a+b = 1/2 + 5/6 = \boxed{5/3}$$

$$\begin{aligned} a + [b] &= 5/12 \rightarrow 12b = 5/12 + .12 = 5/10 \\ b - [a] &= 1/5 \end{aligned} \quad \hookrightarrow \begin{aligned} a &= 5/12 \\ b &= 1/12 \end{aligned}$$

$$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 19 \text{ A}$$

$$(1 + \sqrt{2})^4 = 191 - (1 - \sqrt{2}) \rightarrow -1 < 1 - \sqrt{2} < 0 \rightarrow 0 < (1 - \sqrt{2})^4 < 1$$

$$[(1 + \sqrt{2})^4] = [19.1 - 0.1] = 19 \checkmark$$