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صفحه: /



19, 20

مسئله معروف از بارزدهم - ۱۱ - کلیف

$$① \frac{1}{n-1} = |n-1| \quad n \neq 1$$

$$|n-1|(n-1) = 1 \Rightarrow |n-1| = 1 \Rightarrow |n-1| = 1 \Rightarrow$$

$$|n-1|(n-1) = 1 \Rightarrow n^2 - 2n + 1 = 1 \Rightarrow n = 0 \text{ یا } n = 2$$

$$n < 1 \Rightarrow -n^2 + 2n - 1 = 1 \Rightarrow n^2 - 2n + 2 = 0 \Rightarrow \Delta < 0 \Rightarrow$$

$n = 2$

$$② \text{ الف) } \left| \frac{r_{n-1}}{n} \right| < r \Rightarrow -r < \frac{r_{n-1}}{n} < r$$

$$① \rightarrow \frac{r_{n-1} - r_n}{n} < 0 \Rightarrow \frac{-1}{n} < 0 \Rightarrow n > 0$$

$$② \rightarrow \frac{r_{n-1} + r_n}{n} > 0 \Rightarrow \frac{r_{n-1}}{n} > 0 \Rightarrow \frac{0}{n} > 0 \Rightarrow \left(-\frac{1}{n}, \frac{1}{n} \right) \cup \left(\frac{1}{n}, \frac{1}{n} \right)$$

$$③ \text{ ب) } \left(\frac{1}{r}, +\infty \right)$$

$$\text{ب) } \left| \frac{n-r}{r_{n+1}} \right| > 1 \Rightarrow$$

$$① \frac{n-r - r_{n+1}}{r_{n+1}} > 0 \Rightarrow \frac{-n-r}{r_{n+1}} > 0 \Rightarrow \frac{-r}{-\frac{1}{r} + \frac{1}{r}} = \left(-r, -\frac{1}{r} \right)$$

$$② \frac{n-r}{r_{n+1}} < -1 \Rightarrow \frac{n-r + r_{n+1}}{r_{n+1}} < 0 \Rightarrow \frac{r_{n+1}}{r_{n+1}} < 0 \Rightarrow \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$\text{الف) } \rightarrow \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$③ \text{ ب) } \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$④ \text{ ب) } \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

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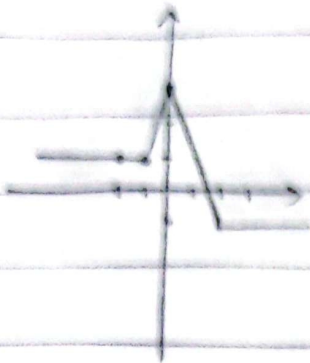
$$③ \text{ ب) } \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$④ \text{ ب) } \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$⑤ \text{ ب) } \left(-r, -\frac{1}{r} \right) \cup \left(-\frac{1}{r}, -\frac{1}{r} \right)$$

$$\rightarrow a = \frac{1}{r}$$

$$① \quad y = |n+1| - |Pn| + |n-1|$$



$$n = -1 \rightarrow y = 1 + P + 1$$

$$n = -P \rightarrow y = 1 + P + 1$$

$$n = 0 \rightarrow y = 1 + P + 1$$

$$n = P \rightarrow y = P + 1 + 1$$

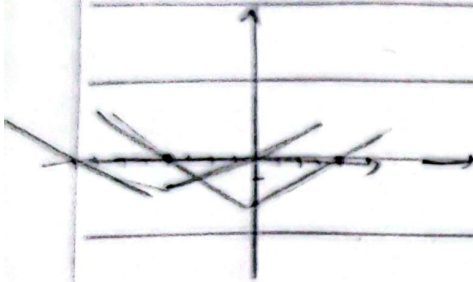
$$n = P \rightarrow y = P + 1 + 1 = -1$$

$$y_{\min} = -1$$

$$y_{\max} = P$$

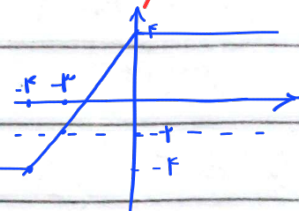
$$P-1 = P$$

$$② \quad y = \left| \frac{1}{P}n \right| - P \rightarrow y = \frac{1}{P}|n| - P \rightarrow y = \frac{1}{P}|n+P| - 1$$

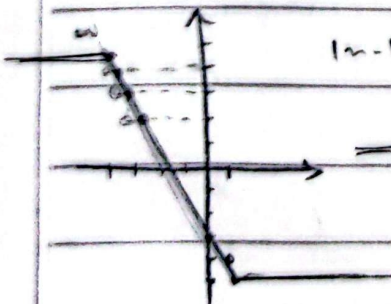


$$x = -P \rightarrow y = -\frac{1}{P}$$

$$\left| -\frac{P}{P} \right| - P$$

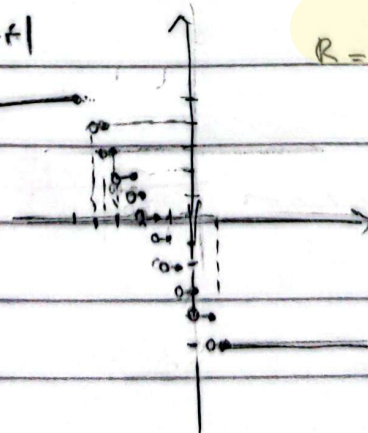


$$③ \quad \text{الف) } f(n) = \begin{bmatrix} |1-n| - |n+P| \\ |n-1| - |n+P| \end{bmatrix}$$



$$|n-1| - |n+P|$$

$$\rightarrow$$



$$R = \{n \in \mathbb{Z} \mid -8 \leq n \leq 8\}$$



٩) ب) $y = \frac{1}{n} - \left[\frac{n+1}{n} \right] \rightarrow n \neq 0$

$$y = \frac{1}{n} - \left[1 + \frac{1}{n} \right] \rightarrow \frac{1}{n} - 1 - \left[\frac{1}{n} \right] = -\left[\frac{1}{n} \right] + \frac{1}{n} - 1$$

$$\frac{1}{n} = t \rightarrow 0 \leq t - [t] < 1 \rightarrow 0 \leq \frac{1}{n} - \left[\frac{1}{n} \right] < 1 \rightarrow -1 \leq \frac{1}{n} - \left[\frac{1}{n} \right] - 1 < 0$$

$$R = [-1, 0)$$

١٠) الف) $y = [-rn] - 1 \quad n \in (-1, 1)$

$$-1 < n < -\frac{1}{r} \rightarrow -r < rn < -1$$

$$-\frac{1}{r} < n < 0 \rightarrow 0 < rn < -1$$

$$0 < n < \frac{1}{r} \rightarrow -1 < rn < 0$$

$$\frac{1}{r} < n < 1 \rightarrow -r < rn < -1$$

$$-\frac{1}{r} < n < -\frac{1}{r} \rightarrow -r$$

$$-\frac{1}{r} < n < -\frac{1}{r} \rightarrow -r$$

$$-\frac{1}{r} < n < -\frac{1}{r} \rightarrow -1$$

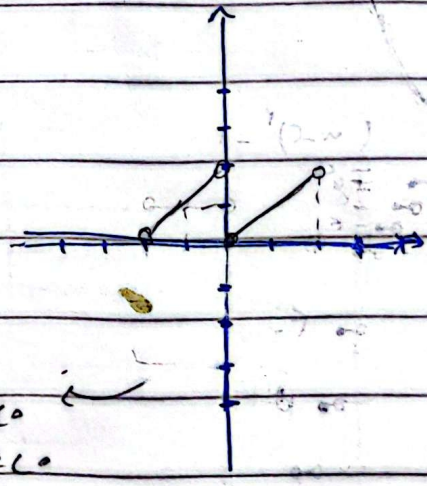
$$-1 < n < -\frac{1}{r} \rightarrow -1$$

ب) $n = r \left[\frac{n}{r} \right] \quad n \in (-r, r)$

$$-r < n < 0 \rightarrow -1 < \frac{n}{r} < 0 \rightarrow y = n + r$$

$$0 < n < r \rightarrow 0 < \frac{n}{r} < 1 \rightarrow y = n$$

$$-r$$



$$-r < n < 0$$

$$0 < n < r$$

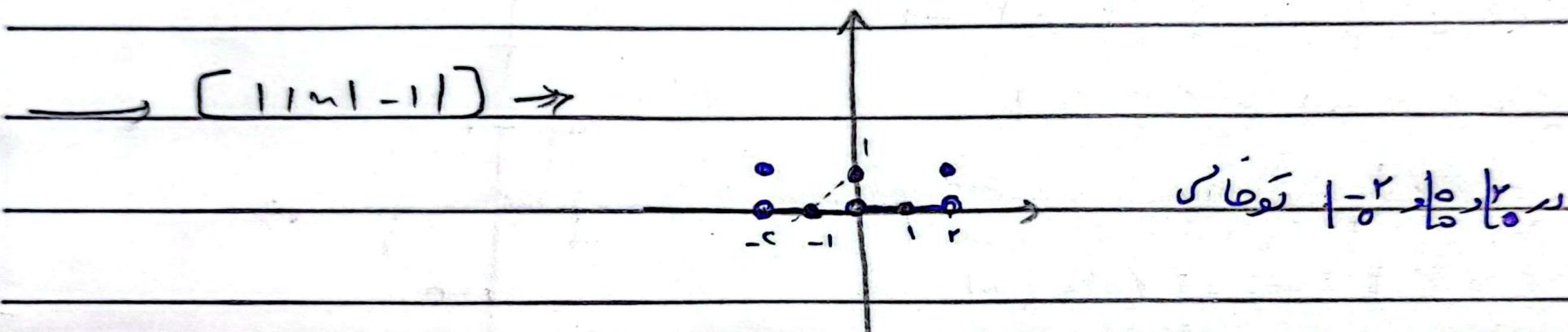
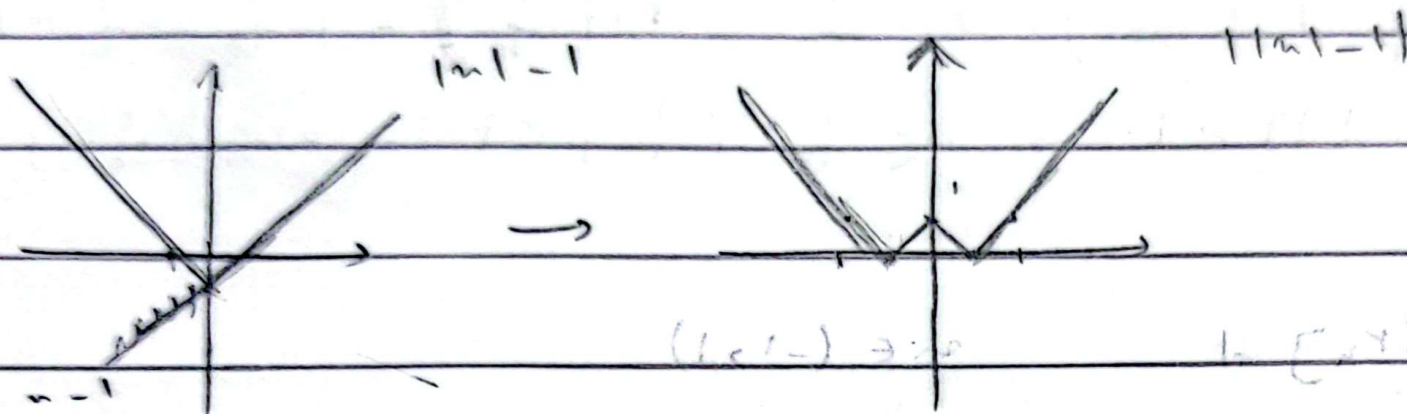


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الف) $g = [11n - 11]$ $n \in [-2, 2]$

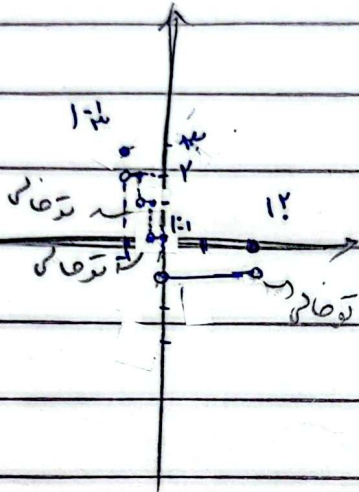




⑧ ب) $y = [x^2 - 2x] \quad x \in [-1, 2]$

$$x = -1 \rightarrow y = 3$$

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



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⑨ $a + [b] = 4, 2 \quad b - [a] = 2, 4$

$$a + y = 4, 2 \rightarrow x + y = 4$$

$$y - x = 2, 4 \rightarrow y - x = 4$$

$$\left. \begin{array}{l} y - x = 2 \\ y + x = 4 \end{array} \right\} \rightarrow 2y = 6 \rightarrow y = 3 \rightarrow x = 1 \rightarrow a = 1, 2$$

$$b = 2, 4$$

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$$a + b = 4, 6$$

⑩ $(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 19 \quad [(1 + \sqrt{2})^4] = ?$

$$3, 2\sqrt{2}$$

$$3 - 2\sqrt{2}$$

کسر به توان زوج

$$1 - \sqrt{2} \approx 1 - 1.4 = -0.4 \rightarrow -1 < 1 - \sqrt{2} < 0 \rightarrow 0 < (1 - \sqrt{2})^4 < 1$$

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

$$1 > 0$$

$$19 - 1 < (1 + \sqrt{2})^4 < 19 - 0 = 18 \rightarrow (1 + \sqrt{2})^4 = 18$$

$$18$$