

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

$$\begin{array}{l|l} \frac{1}{n-1} = -n+1 & \frac{1}{n-1} = n-1 \\ -n^2 + 2n - 2 = 0 & n^2 - 2n + 1 = 1 \\ \Delta < 0 \text{ رشتہ ندارد} & n^2 - 2n = 0 \\ & n = 0 \rightarrow \times \\ & n = 2 \rightarrow \checkmark \end{array}$$

$n=2$ (رشتہ کی رشتہ دار)

1

$$\begin{array}{l} | \frac{2n-1}{n} | < 2 \quad | 2n-1 | < 2|n| \\ (2n-1)^2 < 4n^2 \\ 4n^2 - 4n + 1 < 4n^2 \\ -4n + 1 < 0 \\ n > \frac{1}{4} \cdot n \neq 0 \end{array}$$

مجموعہ جواب $\Rightarrow (\frac{1}{4}, +\infty)$

$$\begin{array}{l} \rightarrow | \frac{n-2}{2n+1} | > 1 \\ |n-2| > |2n+1| \\ (n-2)^2 > (2n+1)^2 \\ n^2 - 4n + 4 > 4n^2 + 4n + 1 \\ 3n^2 + 8n - 3 < 0 \Rightarrow n = \frac{-8 \pm \sqrt{64 + 36}}{6} \\ 2n+1 \neq 0 \rightarrow n \neq -\frac{1}{2} \\ \text{مجموعہ جواب} \Rightarrow (-3, -\frac{1}{2}) \cup (-\frac{1}{2}, \frac{1}{3}) \end{array}$$

2

$|n-1| < 3 \Rightarrow$

$n+9 > n^2 \Rightarrow n^2 - n - 9 < 0 \Rightarrow n = 3$
 $n = -2$

مجموعہ جواب $n^2 < |n+9|$ دیکھ کر درست نہیں لگتا۔ α کی تلاش؟

$$\begin{array}{c} -2 \quad 3 \\ + \quad - \quad + \end{array} \Rightarrow (-2, 3)$$

$n+9 < -n^2 \Rightarrow n^2 + n + 9 < 0 \rightarrow \Delta < 0$ رشتہ نہ ہو $\rightarrow + \quad - \quad + \Rightarrow \times$

3

$-2 < n < 3$ $-\frac{9}{r} < n - \frac{1}{r} < \frac{9}{r} \Rightarrow |n - \frac{1}{r}| < \frac{9}{r} \Rightarrow \boxed{\alpha = \frac{1}{r}}$

$y = |n+1| - |2n+1| + |n-2|$

مجموعہ max, min

$n < -1 \rightarrow y = -(n+1) + 2n - (n-2) = 1$ $n = -1 \Rightarrow y = -2 + 3 = 1$

$-1 < n < 0 \rightarrow y = (n+1) + 2n - (n-2) = 2n+3$ $n = 0 \Rightarrow y = 1 + 2 = 3$

$0 < n < 2 \rightarrow y = (n+1) - 2n - (n-2) = -2n+3$ $n = 2 \rightarrow y = 3 - 4 = -1$

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

$\max + \min = 3 - 1 = \boxed{2}$

4

غور کریں $y = |\frac{n}{r}| - 2$ ، 4 واحد پر n تقسیم دیکھ کر واحد پر n کی تلاش کریں، غور کریں کہ n کا تقاطع ہو

$y = |\frac{n}{r}| - 2 \rightarrow y = |\frac{n+4}{r}| - 2 + 1 = |\frac{n+4}{r}| - 1 \Rightarrow |\frac{n}{r}| - 2 = |\frac{n+4}{r}| - 1$

$|\frac{n}{r}| = |\frac{n+4}{r}| + 1 \Rightarrow |n| = |n+4| + 1$

$n > 0 \rightarrow n = n+4+2 \Rightarrow 0 = 6 \times 5$

$-4 \leq n < 0 \rightarrow -n = n+4+2 \Rightarrow n = -4 \checkmark$

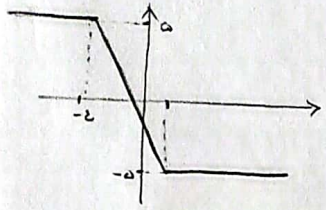
$n < -4 \rightarrow -n = -(n+4)+2 \Rightarrow 0 = -2 \times$

$\boxed{n = -4}$

5

بدرستی باید: $f(x) = [|1-x| - |x+4|] \cdot \frac{x}{y} \mid \begin{matrix} 1 & -4 & -5 & 2 \\ y & -5 & 5 & -5 \end{matrix} \Rightarrow f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right]$

$|1-x| - |x+4| \Rightarrow \begin{matrix} -4 & 1 \\ 1-x+4 & 1-x-x-4 \\ 5 & -2x-3 & -5 \end{matrix}$



$\Rightarrow R_f = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

$R_f = [-1, 0)$

6

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

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

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

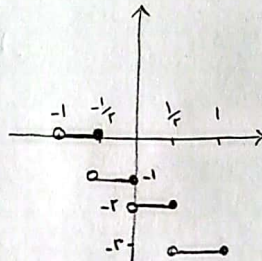
$0 < x \leq \frac{1}{2} \rightarrow y = -1 - 1 = -2$

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

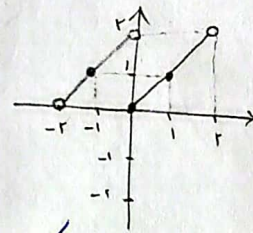
ب) $y = x - 2 \left[\frac{x}{2} \right] \quad x \in (-2, 2)$

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

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



دوره یکتا شدن تابع را رسم کنید.



7

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

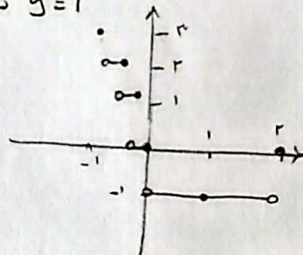
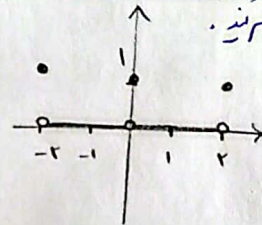
$x = -2 \Rightarrow y = 1 \quad 0 < x \leq 1 \Rightarrow y = 0$

$-2 < x < -1 \Rightarrow y = 0 \quad 1 < x < 2 \Rightarrow y = 0$

$-1 < x < 0 \Rightarrow y = 0 \quad x = 2 \Rightarrow y = 1$

$x = 0 \Rightarrow y = 1$

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



دوره یکتا شدن تابع را رسم کنید.

8

$a + (b - \dots, \epsilon) = 4, 2$

$b - (a - \dots, \epsilon) = 2, 4$

$a + b = 1, 2 + 3, 4 = 4, 6$

الف) $a + b$ و $b - [a] = 2, 4 \cdot a + [b] = 4, 2$

$b - [a] = 2, 4$

$a + [b] = 4, 2 \Rightarrow 2b = 9, 6 + 0, 2 =$

$9, 8$

$\begin{cases} b = 3, 4 \\ a = 1, 2 \end{cases}$

9

الف) $(1 + \sqrt{2})^6 + (1 - \sqrt{2})^6 = 198$ جز صحیح عدد $(1 + \sqrt{2})^2$ را بیابید.

$(1 + \sqrt{2})^6 + (1 - \sqrt{2})^6 = 198$

$(1 + \sqrt{2})^6 = 198 - (1 - \sqrt{2})^6 \Rightarrow -1 < 1 - \sqrt{2} < 0 \Rightarrow 0 < (1 - \sqrt{2})^6 < 1$

$[(1 + \sqrt{2})^6] = [198 - 0, \dots] = 197$

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