

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

$\frac{1}{n-1} = 1-n$ $-n^2 + n - 2 = 0$ $\Delta < 0$ ریشه ندارد	$\frac{1}{n-1} = n-1$ $n^2 - 2n = 0$ $n = 0 \rightarrow$ غلط $n > 1$
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فقط یک ریشه دارد $n=2$

سوال ۱

سوال ۲

$$x < 1 \rightarrow \left| \frac{x-1}{x} \right| < 1 \rightarrow |x-1| < |x| \rightarrow (x-1)^2 < x^2 \rightarrow x^2 - 2x + 1 < x^2 \rightarrow -2x + 1 < 0 \rightarrow x > \frac{1}{2}$$

$$x > 1 \rightarrow \left| \frac{x-1}{x} \right| > 1 \rightarrow |x-1| > |x| \rightarrow (x-1)^2 > x^2 \rightarrow x^2 - 2x + 1 > x^2 \rightarrow -2x + 1 > 0 \rightarrow x < \frac{1}{2}$$

$$x = -3, x = \frac{1}{3}$$

$$\text{①} \cap \text{②} \rightarrow (-3, -\frac{1}{2}) \cup (-\frac{1}{2}, \frac{1}{3})$$

$$x^2 < |x+4| \rightarrow |x-2| < 3 \quad \alpha = ?$$

$$x^2 < |x+4| \rightarrow x+4 > x^2 \rightarrow x^2 - x - 4 < 0 \rightarrow x = 3, x = -2 \rightarrow \begin{array}{c} -2 \\ +4 \\ -4 \\ + \end{array} \rightarrow (-2, 3)$$

$$-4 < x < 3 \rightarrow \frac{-6}{x} < x - \frac{1}{x} < \frac{6}{x} \rightarrow |x - \frac{1}{x}| < \frac{6}{x} \rightarrow \alpha = \frac{1}{x}$$

سوال ۳

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

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

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

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

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

$$\max, \min = 3 - 1 = 2$$

سوال ۴

$$y = \left| \frac{x}{y} - 2 \right| \rightarrow y = \left| \frac{x+4}{y} \right| - 2 + 1 = \left| \frac{x+4}{y} \right| - 1$$

$$\left| \frac{x}{y} \right| - 2 = \left| \frac{x+4}{y} \right| - 1 \rightarrow \left| \frac{x}{y} \right| = \left| \frac{x+4}{y} \right| + 1 \rightarrow |x| = |x+4| + y$$

$$x > 0 \rightarrow x = x+4+y \rightarrow 0 = 4+y$$

طول مثلث متساوی الساقین = ۳

$$-4 \leq x \leq 0 \rightarrow -x = x+4+y \rightarrow x = -3$$

$$x < -4 \rightarrow -x = -x-4+y \rightarrow 0 = -2+y$$

سوال ۵

مثال ٧: $f(x) = [1 - x - |x+1|] \rightarrow \begin{cases} -x & |x| \leq 1 \\ -x-2 & |x| > 1 \end{cases}$

$R = \{-\infty, -4, -2, -1, 0, 1, 2, 3, \infty\}$

ب) $f(x) = \frac{1}{x} - [\frac{x+1}{x}]$: $\frac{1}{x} - 1 - [\frac{1}{x}] \rightarrow a - [a] - 1 \Rightarrow R = [-1, 0)$

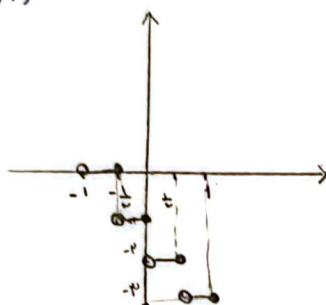
مثال ٨: $y = [-2x] - 1$ $x \in (-1, 1)$

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

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

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

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

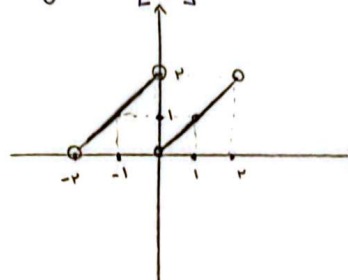


ب) $y = x - 2[\frac{x}{2}]$ $x \in (-2, 2)$

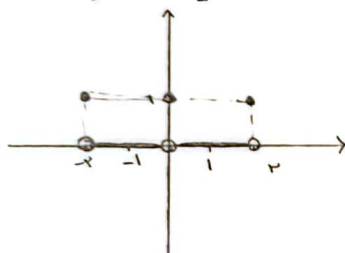
$-2 \leq x < 0 \rightarrow y = x - 2(-1) = x + 2$

$= x + 2$

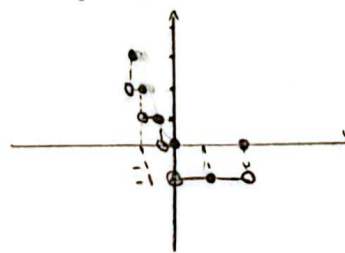
$0 \leq x < 2 \rightarrow y = x - 2(0) = x$



مثال ٩: $y = [1|x| - 1]$ $x \in [-2, 2]$



ب) $y = [x^2 - 2x]$ $x \in [-1, 2]$



$a + [b] = 4, 2$ $b - [a] = 2, 4$ $a + b = ?$

$a + (b - 0, 4) = 4, 2$

$\Rightarrow 2b = 4, 4 + 0, 4 = 4, 8 \rightarrow b = 2, 4 \rightarrow a = 1, 2$

$b - (a - 0, 2) = 2, 4$

$\rightarrow a + b = 1, 2 + 2, 4 = 3, 4$

$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 198$ $[(1 + \sqrt{2})^4] = ?$

$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 198 \rightarrow (1 + \sqrt{2})^4 = 198 - (1 - \sqrt{2})^4$

$-1 < 1 - \sqrt{2} < 0 \Rightarrow 0 < (1 - \sqrt{2})^4 < 1 \rightarrow [(1 + \sqrt{2})^4] = [198 - 0, \dots] = 197$