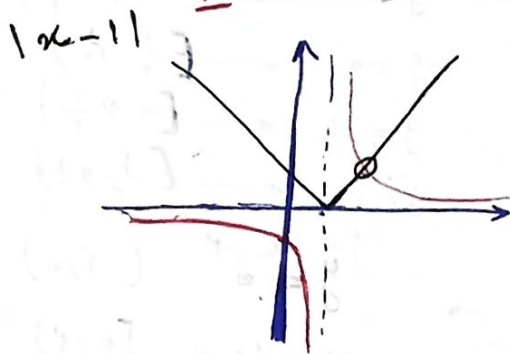


① $\frac{1}{x-1} = |x-1|$



۱ ریشه دارد.

الف) ② $-2 < \frac{2x-1}{x} < 2 \rightarrow -2 < 2 - \frac{1}{x} < 2 \rightarrow 0 < \frac{1}{x} < 4 \rightarrow \boxed{0 < x < \frac{1}{4}}$

ب) $\frac{x-2}{2x+1} > 1 \quad \vee \quad \frac{x-2}{2x+1} < -1 \rightarrow \frac{-x-3}{2x+1} > 0 \rightarrow \frac{-x-3}{2x+1} > 0$

$\frac{-x-3}{2x+1} > 0 \rightarrow x \in (-3, -\frac{1}{2})$ (II)

$\frac{-x-3}{2x+1} < 0 \rightarrow x \in (-\frac{1}{2}, \frac{1}{2})$ (I) $\cup$ (II) $= (-\frac{1}{2}, \frac{1}{2}) \cup (-3, -\frac{1}{2})$

③ اگر $x < -4 \rightarrow x^2 + x + 4 < 0 \rightarrow$ غلط و اگر $x > -4 \rightarrow x^2 - x - 4 < 0$

$\frac{-x+3}{x} = \frac{1}{x} \rightarrow -2 < x < 3 \rightarrow x \in (-2, 3) \leftarrow (x-3)(x+2) < 0$

$-\frac{5}{2} < x - \frac{1}{2} < \frac{5}{2} \rightarrow |x - \frac{1}{2}| < \frac{5}{2} \rightarrow \boxed{x = \frac{1}{2}}$

④ $\frac{-1}{x+3} \rightarrow R_y = [-1, 3] \rightarrow \boxed{y_{\max} = 3}$
 $\boxed{y_{\min} = -1}$

⑤ $|\frac{1}{x}(x+2)| - 1 = |\frac{1}{x}x| - 2 \rightarrow |\frac{1}{x}x + 2| - |\frac{1}{x}x| = -1$
 $x + 2 = -1 \rightarrow \boxed{x = -3}$

الف) $\frac{-5}{-2x-3} \rightarrow R_f = [-5, 5]$
 ب) $\frac{5}{x} \rightarrow R_f = [-5, 5]$

⑥ $\frac{1}{x} \in [1 + \frac{1}{x}] \rightarrow \frac{1}{x} - [\frac{1}{x}] - 1 \rightarrow \frac{1}{x} - 1 < 0$
 $\frac{1}{x} - 1 < 0 \rightarrow \frac{1-x}{x} < 0 \rightarrow \boxed{R_f = [-1, 0]}$

⑤ $y = [-2x] - 1 \rightarrow$

الف

$y = 1 \leftarrow (-1, -\frac{1}{2})$

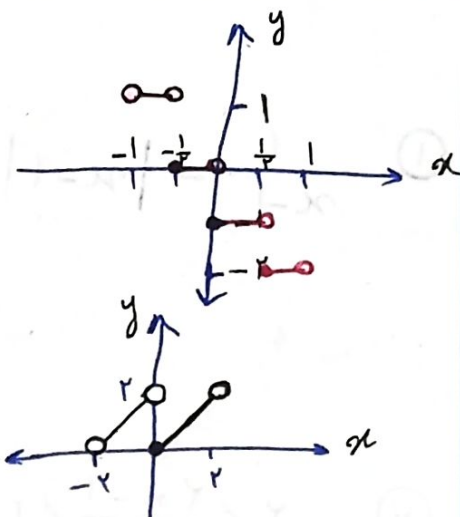
$y = 0 \leftarrow (-\frac{1}{2}, 0)$

$y = -1 \leftarrow (0, \frac{1}{2}) \rightarrow$

$y = -2 \leftarrow (\frac{1}{2}, 1)$

$y = x + 2 \quad (-2, 0)$

$y = x \quad (0, 2)$

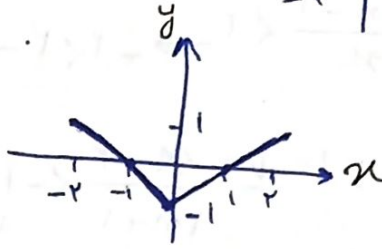
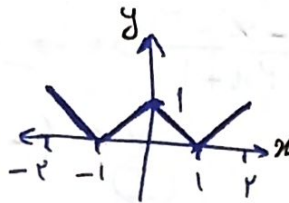


ب) $y = x - 2 \left[\frac{x}{2} \right] \rightarrow$

⑧ $y = [|x| - 1] \rightarrow y = |x| - 1$

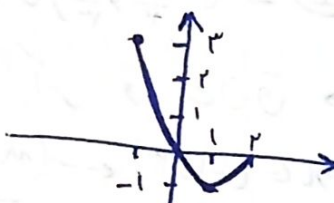
$y = |x| - 1 \rightarrow$

الف

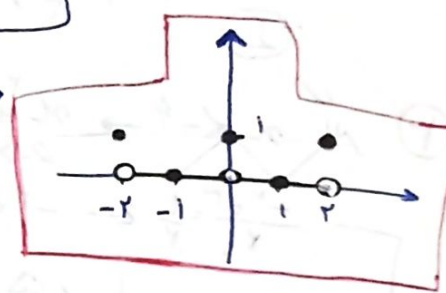
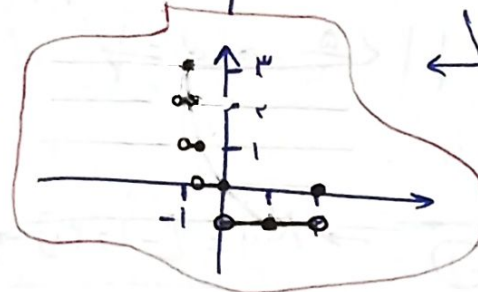


$[|x| - 1] =$

ب) $y = x^2 - 2x \rightarrow$



$y = [x^2 - 2x]$



⑨ $[a] + [b] = [4, 2]$

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

$2[b] = 4 \rightarrow [b] = 2, \rightarrow b = 2, 4, [a] + 2 = 4 \rightarrow [a] = 2 \rightarrow a = 2, 4$

$a + b = 4, 6$

⑩ $[(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4] = [198] \rightarrow [(1 + \sqrt{2})^4] + [(1 - \sqrt{2})^4] = 198$

چون جمع قیمت اعشاری شان به یک نمی رسد.

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

$\approx (-9.4)^4$