

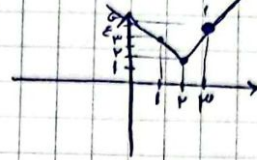
تکلیف ۷

نکته

از هر دو طرف

الف) $y = |2x - 5| + x$

$\frac{2}{x-5}$

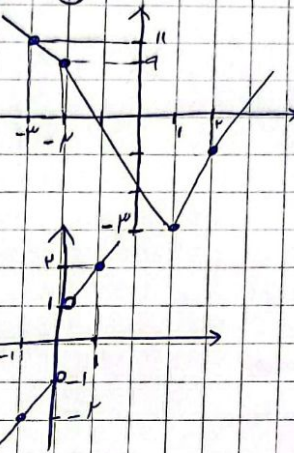
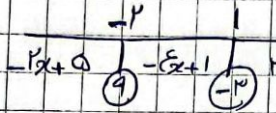


$R_f = [2.5, +\infty)$ 1

ب) $y = |x - 2| + |x - 1| - |x|$

$R_f = [-1, +\infty)$

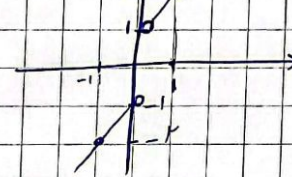
$|x - 2| - |x + 2| = k$



$y = k = -3$

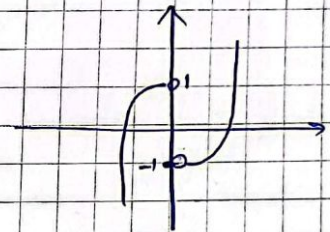
فقط در این نقطه
بسیار خوب و زیاده

الف) $y = x + \frac{x}{|x|} \rightarrow \begin{cases} x \neq 0 \\ \oplus \rightarrow x + 1 \\ \ominus \rightarrow x - 1 \end{cases}$



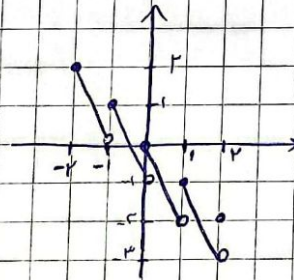
3

ب) $y = x|x| - \frac{x}{|x|} \rightarrow \begin{cases} x \neq 0 \\ \oplus \rightarrow x^2 - 1 \\ \ominus \rightarrow -x^2 + 1 \end{cases}$

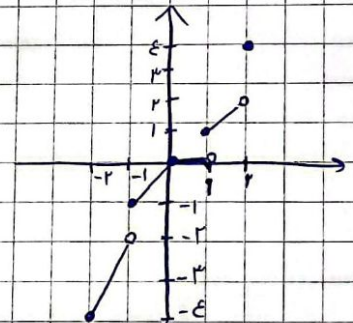


4

الف) $y = [x] - 2x \rightarrow \begin{cases} -2 < x < -1 \rightarrow -2 - 2x \\ -1 < x < 0 \rightarrow -1 - 2x \\ 0 < x < 1 \rightarrow -2x \\ 1 < x < 2 \rightarrow 1 - 2x \\ x < 2 \rightarrow -2 \end{cases}$



ب) $y = [x]|x| \rightarrow \begin{cases} -2 < x < -1 \rightarrow 2x \\ -1 < x < 0 \rightarrow x \\ 0 < x < 1 \rightarrow 0 \\ 1 < x < 2 \rightarrow x \\ x < 2 \rightarrow x \end{cases}$

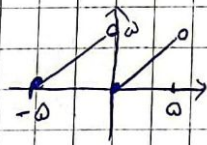


الف) $y = 2x - [2x] \rightarrow R_f = [0, 1)$

$0 < [2x] - 2x < 1$

ب) $y = \varepsilon x - \varepsilon [x] = \varepsilon (x - [x]) \rightarrow 0 < x - [x] < 1 \xrightarrow{\times \varepsilon} R_f = [0, \varepsilon)$

ج) $y = x - \varepsilon \left[\frac{x}{\varepsilon} \right] \rightarrow \begin{cases} 0 < x < \varepsilon \rightarrow x \\ \varepsilon < x < 2\varepsilon \rightarrow x + \varepsilon \\ 2\varepsilon < x < 3\varepsilon \rightarrow x + 2\varepsilon \end{cases}$



$R_f = [0, \varepsilon)$

د) $y = [2x] - 2x \rightarrow R_f = (-1, 0)$

$-1 < [2x] - 2x < 0$



$$الف) y = 3 \sin x + 4 \cos x \rightarrow -\sqrt{13} < y < \sqrt{13} \rightarrow R_f: [-\sqrt{13}, \sqrt{13}]$$

$$ب) y = 5 \sin x - 12 \cos x \rightarrow -\sqrt{13} < y < \sqrt{13} \rightarrow R_f: [-\sqrt{13}, \sqrt{13}]$$

$$ج) y = [3 \sin x + 4 \cos x] \rightarrow -\sqrt{13} < y < \sqrt{13} \rightarrow [-\sqrt{13}, \sqrt{13}] \rightarrow R_f: \{-4, -2, 0, 2, 4\}$$

$$د) y = \sqrt{\cos x - 3 \sin x} \rightarrow -\sqrt{10} < y < \sqrt{10} \rightarrow R_f: [0, \sqrt{10}]$$

.7

$$الف) y = \sin^2 x + 3 \sin x + 2 \rightarrow \begin{cases} 1 \rightarrow 4 \\ 0 \rightarrow 2 \\ -\frac{b}{2a} = -\frac{3}{2} \end{cases} \rightarrow R_f: [0, 4]$$

$$\sin x = -1 \rightarrow 1 - 3 + 2 = 0$$

$$ب) y = 3 \sin^2 x + 4 \sin x + 2 \rightarrow \begin{cases} 1 \rightarrow 9 \\ 0 \rightarrow 2 \\ -\frac{b}{2a} = -\frac{2}{3} \end{cases} \rightarrow R_f: [1, 9]$$

$$\sin x = -\frac{2}{3} \rightarrow 3 - \frac{4}{3} + 2 = 1$$

.8

$$الف) y = \sin^2 x + 5 \cos^2 x = 4 \cos^2 x + 1 \rightarrow R_f: [1, 5]$$

$$ب) y = \frac{2 \cot x}{1 + \cot^2 x} = \sin^2 x \rightarrow R_f: [-1, 1] - \{0\}$$

$$\frac{1}{\sin^2 x} \rightarrow \sin x \neq 0 \rightarrow x \neq 0$$

$$الف) y = \frac{\sin^4 x + \cos^4 x}{y} \rightarrow y^{1-4} < y < 1 \rightarrow R_f: [\frac{1}{3}, 1]$$

.9

$$ب) y = [\sin^4 x + \cos^4 x] \rightarrow y^{1-4} < y < 1 \rightarrow [\frac{1}{3}, 1] \xrightarrow{\text{نكته}} \{0, 1\}$$

.10

$$الف) y = \frac{x^2 + 6x - 5}{x + 5} \rightarrow (x-1)(x+5) \rightarrow R_f: \mathbb{R} - \{-5\}$$

$$x \neq -5$$

$$ب) y = \frac{x^2 - 1}{x - 1} = x + 1 \rightarrow R_f: [\frac{1}{\epsilon}, +\infty) - \{1\}$$

$$x \neq 1$$

