

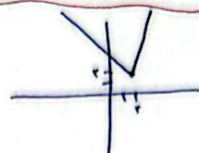
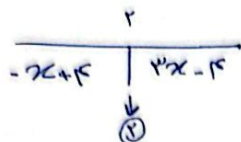
تکلیف ۱

از دست نده

18, 50

زینا علیجانی

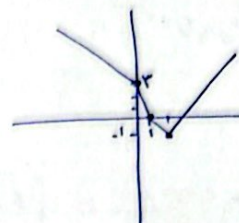
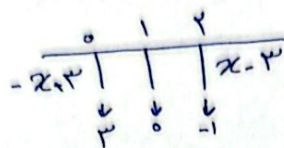
الف) $x + |2x - 4|$



$\Rightarrow R = [2, +\infty)$

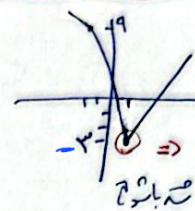
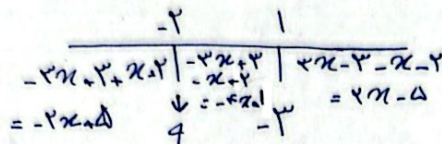
1

ب) $y = |x - 2| + |x - 1| - |x|$



$\Rightarrow R = [-1, +\infty)$

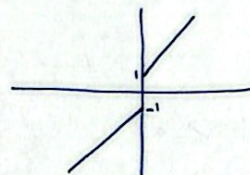
$y = |3x - 3| - |x + 2|$



1, 10

الف) $y = x + \frac{x}{|x|}$

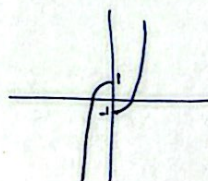
$\begin{cases} x+1 & x > 0 \\ x-1 & x < 0 \end{cases}$



3

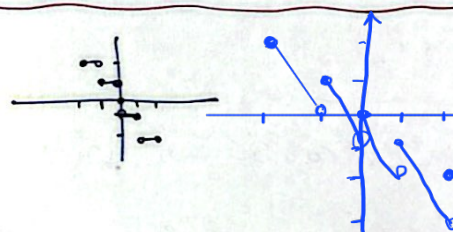
ب) $y = x|x| - \frac{x}{|x|}$

$\begin{cases} x^2 - 1 & x > 0 \\ -x^2 + 1 & x < 0 \end{cases}$



الف) $y = [x] - 2x$

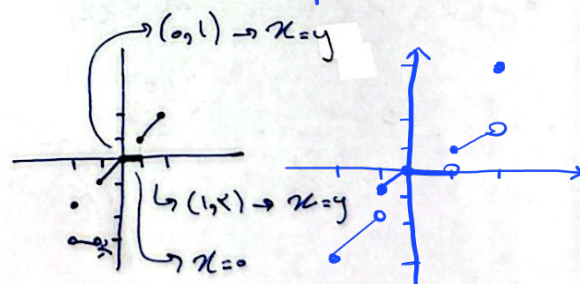
$\begin{cases} -x & x \in \mathbb{Z} \\ [-x] & x \notin \mathbb{Z} \end{cases}$



5

ب) $y = [x]|x|$

$\begin{cases} x^2 & x > 0, x \in \mathbb{Z} \\ x[x] & x > 0, x \notin \mathbb{Z} \\ -x^2 & x < 0, x \in \mathbb{Z} \\ -x[x] & x < 0, x \notin \mathbb{Z} \end{cases}$



الف) $3x - [3x] \rightarrow = 3x \Rightarrow 3x \in [0, 1)$

2) $x \in [0, 1)$

$R = [0, 1)$

3) $[x] + x \rightarrow R = (-1, 0)$

4

ب) $4x - 4[x] = 4(x - [x]) = 4x \Rightarrow 4x \in [0, 1)$

$\Rightarrow R = [0, 1)$

5

$$\text{الف) } y = 3\sin x + 2\cos x \rightarrow -\sqrt{a^2+b^2} \leq a\sin x + b\cos x \leq \sqrt{a^2+b^2}$$

$$-\sqrt{9+4} \leq y \leq \sqrt{9+4} \Rightarrow -\sqrt{13} \leq y \leq \sqrt{13} \Rightarrow R = [-\sqrt{13}, \sqrt{13}]$$

1, 1, 0

$$\text{ب) } y = 4\sin x - 3\cos x \rightarrow -\sqrt{16+9} \leq y \leq \sqrt{16+9} \Rightarrow R = [-5, 5]$$

$$\text{ج) } y = [2\sin x + 3\cos x] \rightarrow -\sqrt{4+9} \leq y \leq \sqrt{4+9} \Rightarrow -\sqrt{13} \leq y \leq \sqrt{13}$$

$$\Rightarrow R = \{-9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$\text{د) } y = \sqrt{\cos x - 2\sin x} \rightarrow -\sqrt{1+4} \leq y \leq \sqrt{1+4} \rightarrow -\sqrt{5} \leq y \leq \sqrt{5} \Rightarrow R = [-\sqrt{5}, \sqrt{5}]$$

$$\text{الف) } y = \sin^2 x + 3\sin x + 2$$

$$\left| \frac{-b}{2a} = \frac{-3}{2} \right| \text{ Cose}$$

$$\left| \frac{1}{1+3+2} = \frac{1}{6} \right| \text{ max}$$

$$\left| \frac{-1}{1-3+2} = -1 \right| \text{ min}$$

$$\Rightarrow R = \left[-\frac{1}{6}, 6 \right]$$

1, 0

$$\text{ب) } 2\sin^2 x + 3\sin x + 2$$

$$\left| \frac{-b}{2a} = \frac{-3}{4} \right|$$

$$\left| \frac{1}{2+3+2} = \frac{1}{7} \right| \text{ max}$$

$$\left| \frac{-1}{2-3+2} = -1 \right| \text{ min}$$

$$R = \left[\frac{1}{7}, 7 \right]$$

$$\text{الف) } \sin^2 x + 3\cos^2 x \rightarrow \sin^2 x + \cos^2 x + 2\cos^2 x = 1 + 2\cos^2 x$$

$$0 \leq \cos^2 x \leq 1 \Rightarrow 0 \leq 2\cos^2 x \leq 2 \Rightarrow 1 \leq 1 + 2\cos^2 x \leq 3 \Rightarrow R = [1, 3]$$

5

$$\text{ب) } \frac{2\cot x}{1+\cot^2 x} = \frac{2 \frac{\cos x}{\sin x}}{\frac{1}{\sin^2 x}} = 2\cos x \sin x = \sin(2x) \Rightarrow R = [-1, 1]$$

$$\text{الف) } y = \sin^6 x + \cos^6 x = (\sin^2 x + \cos^2 x)(\sin^4 x + \cos^4 x - \sin^2 x \cos^2 x)$$

$$= (\sin^2 - \cos^2)^2 = (-\cos(2x))^2 \Rightarrow R = [0, 1]$$

4, 1, 0

$$\text{ب) } [\sin^2 x + \cos^2 x] \rightarrow \{0, 1\}$$

$$\mu^{1-k} \leq \sin^2 x + \cos^2 x \leq 1$$

$$\text{الف) } y = \frac{x^2 + \sqrt{x} - 1}{x + 1} = x - 1 \rightarrow R = \mathbb{R}$$

$$\text{ب) } \frac{x^2 - 1}{x - 1} = \frac{(x-1)(x+1)}{x-1} = x+1$$

1, 0

$$x \neq -1 \quad R = \mathbb{R} - \{-1\}$$

$$x^2 + x + 1 \rightarrow \left| \frac{-b}{2a} = \frac{-1}{2} \right|$$

$$\left| \frac{1}{\frac{1}{4} - \frac{1}{4} + 1} = \frac{1}{1} \right|$$

1, 0