

19,0

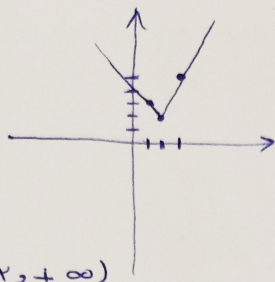
نام و نام خانوادگی: ... عزیز محمد رضایی ... پاسخنامه تشریحی تکلیف شماره ۷ ... کلاس: ...

الف) $y = x + |2x - 4|$

$$\begin{array}{r|l} 2 & x-2x+4 \\ \hline x-2x+4 & 2x-4 \\ -x+4 & \end{array}$$

$1 \rightarrow 2$
 $2 \rightarrow 2$
 $3 \rightarrow 4$

$Ry = [2, +\infty)$

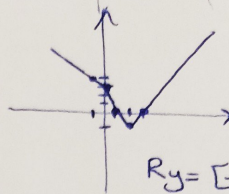


ب) $y = |x-2| + |x-1| - |x|$

$$\begin{array}{r|l} 0 & -x+2-x+1+x \\ \hline -x+2-x+1+x & -x+2-x+1+x \\ -x+3 & \end{array}$$

$-1 \rightarrow 4$
 $0 \rightarrow 3$
 $1 \rightarrow 0$
 $2 \rightarrow -1$
 $3 \rightarrow 0$

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

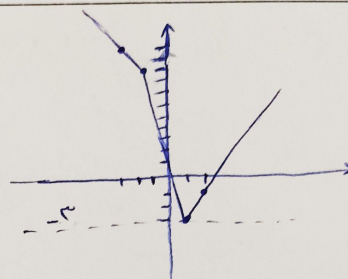


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$$\begin{array}{r|l} -3 & -3x+3+x+2 \\ \hline -3x+3+x+2 & -3x+3+x+2 \\ -2x+5 & \end{array}$$

$-3 \rightarrow 11$
 $-2 \rightarrow 9$
 $1 \rightarrow -3$
 $2 \rightarrow -1$

$k = -3$

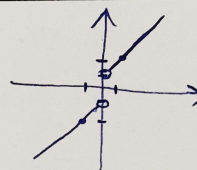


1, 1, 1, 0

الف) $y = x + \frac{x}{|x|}$

$$\begin{array}{r|l} 0 & x+\frac{x}{-x} \\ \hline x+\frac{x}{-x} & x+\frac{x}{-x} \\ x+1 & \end{array}$$

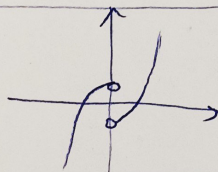
$0 \rightarrow -1$
 $-1 \rightarrow -2$
 $1 \rightarrow 2$
 $0 \rightarrow 1$



ب) $y = x|x| - \frac{x}{|x|}$

$$\begin{array}{r|l} 0 & -x^2+1 \\ \hline -x^2+1 & -x^2+1 \\ x^2-1 & \end{array}$$

$-1 \rightarrow 0$
 $0 \rightarrow 1$
 $0 \rightarrow -1$
 $1 \rightarrow 0$



5

الف) $y = [x] - 2x$

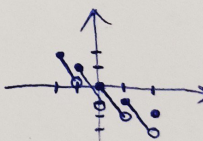
$[-1, 0) \rightarrow [x] = -1 \rightarrow y = -2x - 1$

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

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

$[1, 2) \rightarrow [x] = 1 \rightarrow y = -2x + 1$

$2 \rightarrow -2$



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ب) $y = [x]|x|$

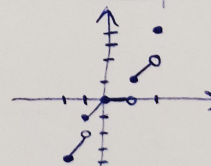
$[-1, 0) \rightarrow [x] = -1 \rightarrow y = x$

$[0, 1) \rightarrow [x] = 0 \rightarrow y = 0$

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

$[1, 2) \rightarrow [x] = 1 \rightarrow y = x$

$2 \rightarrow 4$



الف) $y = 3x - [3x] \rightarrow 0 \leq a - [a] < 1 \rightarrow Ry = [0, 1)$

ب) $y = 4x - 4[x] \rightarrow 4(x - [x]) \rightarrow 0 \leq x - [x] < 1 \rightarrow 0 \leq 4(x - [x]) < 4 \rightarrow Ry = [0, 4)$

ج) $y = x - \omega\left[\frac{x}{\omega}\right] \rightarrow \omega\left(\frac{x}{\omega} - \left[\frac{x}{\omega}\right]\right) \rightarrow 0 \leq x - [x] < 1 \rightarrow 0 \leq \omega(x - [x]) < \omega \rightarrow Ry = [0, \omega)$

د) $y = [2x] - 2x \rightarrow -1 < [a] - a \leq 0 \rightarrow Ry = (-1, 0]$

5

الف) $y = 3 \sin x + 4 \cos x \rightarrow -\sqrt{17} \leq 3 \sin x + 4 \cos x \leq \sqrt{17} \rightarrow R_y = [-\sqrt{17}, \sqrt{17}]$
 ب) $y = 4 \sin x - 3 \cos x \rightarrow -\sqrt{14+9} \leq 4 \sin x - 3 \cos x \leq \sqrt{14+9} \rightarrow R_y = [-5, 5]$
 ج) $y = [3 \sin x + 4 \cos x] \rightarrow -\sqrt{17} \leq 3 \sin x + 4 \cos x \leq \sqrt{17} \rightarrow R_y = [-\sqrt{17}, \sqrt{17}]$
 د) $y = \sqrt{\cos x - 3 \sin x} \rightarrow -\sqrt{5} \leq \cos x - 3 \sin x \leq \sqrt{5} \rightarrow R_y = [-\sqrt{5}, \sqrt{5}]$

الف) $y = \sin^2 x + 3 \sin x + 2$
 $1 + 3 + 2 = 4 \rightarrow R_y = [0, 4]$
 $-1 \leq \sin x \leq 1 \rightarrow X = \frac{-b}{2a} = \frac{-3}{2}$

ب) $y = 3 \sin^2 x + 3 \sin x + 2$
 $3 + 3 + 2 = 8 \rightarrow R_y = [\frac{1}{3}, 8]$
 $\frac{-b}{2a} = \frac{-3}{6} = \frac{1}{2}$

الف) $y = \sin^2 x + 4 \cos^2 x \rightarrow 1 - \cos^2 x + 4 \cos^2 x = 1 + 3 \cos^2 x$
 $0 \leq \cos^2 x \leq 1 \rightarrow 1 + 3(0) \leq 1 + 3(1) \leq 4 \rightarrow R_y = [1, 4]$
 ب) $y = \frac{3 \cot x}{1 + \cot^2 x} = \frac{3 \cos x}{\sin x} = 3 \sin x \cos x = \frac{3}{2} \sin 2x \rightarrow R_y = [-\frac{3}{2}, \frac{3}{2}]$

الف) $y = \sin^4 x + \cos^4 x \rightarrow 1 - 2 \sin^2 x + \sin^4 x + \cos^4 x = 1 - 2 \sin^2 x + \sin^4 x + 1 - \sin^4 x = 2 - 2 \sin^2 x$
 $0 \leq \sin^2 x \leq 1 \rightarrow 2 - 2(1) \leq 2 - 2(0) \leq 2 \rightarrow R_y = [0, 2]$
 ب) $y = [\sin^4 x + \cos^4 x] \rightarrow 1 - 2 \sin^2 x + \sin^4 x + \cos^4 x = 1 - 2 \sin^2 x + \sin^4 x + 1 - \sin^4 x = 2 - 2 \sin^2 x$
 $0 \leq \sin^2 x \leq 1 \rightarrow 2 - 2(1) \leq 2 - 2(0) \leq 2 \rightarrow R_y = [0, 2]$

الف) $\frac{2x^2 + 5x - 3}{x + 2} = \frac{(x+3)(2x-1)}{x+2} = 2x - 1$
 $2x - 1 = -9 \rightarrow 2x = -8 \rightarrow x = -4$
 $R_y = \mathbb{R} - \{-9\}$

ب) $\frac{x^2 - 1}{x - 1} = \frac{(x-1)(x+1)}{x-1} = x + 1$
 $x + 1 = 1 \rightarrow x = 0$
 $R_y = [\frac{1}{2}, +\infty)$

