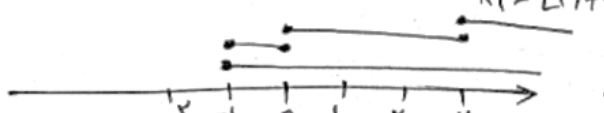


۱۷، ۲۵

پاسخنامه تشریحی تکلیف شماره ۷... کلاس

نام و نام خانوادگی: ابراهیم ابراهیم

$$y = x + |2x - 4| \xrightarrow{x=2} \begin{cases} 3x - 4; x \geq 2 \rightarrow R_1 = [2, +\infty) \\ -x + 4; x \leq 2 \rightarrow R_2 = [2, +\infty) \end{cases} \Rightarrow R_y = [2, +\infty) \quad (2)$$

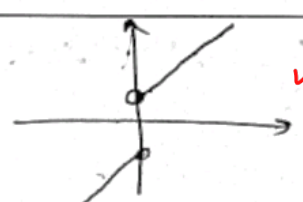
$$b) y = |x-2| + |x-1| - |x| \Rightarrow \begin{matrix} -x+3 & -3x+3 & -x+1 & x-3 \\ R_1 = [2, +\infty) & R_2 = [0, 3] & R_3 = [-1, 0] & R_4 = [-1, +\infty) \end{matrix}$$


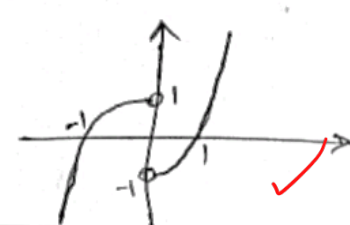
$$R_y = [-1, +\infty) \quad \checkmark$$

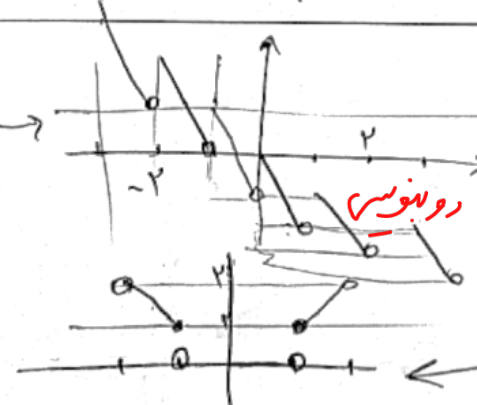
$$|3x-3| - |x+2| = k \rightarrow \begin{matrix} -2 & 1 \\ -2x+k+3 & -x+1 & 2x-3-k \end{matrix}$$

$$\rightarrow -x+1=0 \rightarrow x=\frac{1}{2} \xrightarrow{\text{فقط یک ریشه}} \begin{cases} 2(\frac{1}{2}) - 3 - k = 0 \\ -2(\frac{1}{2}) + k + 3 = 0 \end{cases} \rightarrow k = -\frac{5}{2}$$

ظاهر بودن شکل تابع در رسم می کردی
بعد جایی که خط و مقدار به نقطه برخورد
داشتن مقدار k بود $k = -3$

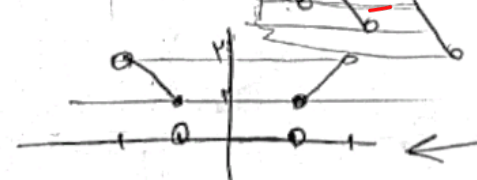
$$a) y = x + \frac{x}{|x|} \xrightarrow{x>0} x+1 \xrightarrow{x \neq 0} \xrightarrow{x<0} x-1$$


$$b) y = x|x| - \frac{x}{|x|} \xrightarrow{x>0} x^2-1 \xrightarrow{Df \neq \{0\}} \xrightarrow{x<0} -x^2+1$$


$$a) y = [x] - 2x$$


$$R_y = (-\infty, +\infty)$$

باید حتماً به بندگی ها رو بنویسی

$$b) [x] / x$$


$$a) y = 3x - [3x] \xrightarrow{0 \leq \{3x\} < 1} \Rightarrow R_y = [0, 1) \quad \checkmark$$

$$b) y = 4x - [4x] = 4(x - [x]) \xrightarrow{0 \leq x - [x] < 1} \Rightarrow 0 \leq 4(x - [x]) < 4 \Rightarrow R_y = [0, 4) \quad \checkmark$$

$$c) y = x - 8 \left[\frac{x}{8} \right] \Rightarrow R_y = [0, 8) \quad \checkmark$$

$$d) y = [x] - 2x \xrightarrow{-k[3] - 3 \leq 0} \Rightarrow R_y = [-1, 0) \quad \checkmark$$

الف) $y = 3 \sin x + 1 \cos x \Rightarrow -\sqrt{9+1} \leq 3 \sin x + 1 \cos x \leq \sqrt{9+1} \Rightarrow Ry = [-\sqrt{10}, \sqrt{10}]$ ✓

ب) $y = 1 \sin x - 3 \cos x \Rightarrow -\sqrt{1+9} \leq 1 \sin x + (-3) \cos x \leq \sqrt{10} \Rightarrow Ry = [-\sqrt{10}, \sqrt{10}]$ ✓

ج) $y = [1 \sin x + 3 \cos x] \xrightarrow{-\sqrt{a^2+b^2} \leq a \sin x + b \cos x \leq \sqrt{a^2+b^2}} -\sqrt{10} \leq [1 \sin x + 3 \cos x] \leq \sqrt{10} \Rightarrow Ry = [-\sqrt{10}, \sqrt{10}]$ ✓

د) $y = \sqrt{\cos x - 1 \sin x} \xrightarrow{Ry \rightarrow} -\sqrt{8} \leq (\cos x + (-1) \sin x) \leq \sqrt{8} \Rightarrow Ry = [-\sqrt{8}, \sqrt{8}]$ ✓

الف) $y = \sin^2 x + 3 \sin x + 1 \xrightarrow{-1 \leq \sin x \leq 1} \begin{cases} 1-3+1 = -1 \\ 1+3+1 = 5 \end{cases} \Rightarrow Ry = [-1, 5]$ ✓

ب) $y = 1 \sin^2 x + 3 \sin x + 1 \xrightarrow{-1 \leq \sin x \leq 1} \begin{cases} 1-3+1 = -1 \\ 1+3+1 = 5 \end{cases} \Rightarrow Ry = [-1, 5]$ ✓

ج) $y = 1 \sin^2 x + 3 \sin x + 1 \xrightarrow{-1 \leq \sin x \leq 1} \begin{cases} 1-3+1 = -1 \\ 1+3+1 = 5 \end{cases} \Rightarrow Ry = [-1, 5]$ ✓

الف) $y = \sin^2 x + 1 \cos^2 x = \sin^2 x + 1(1 - \sin^2 x) = -\sin^2 x + 1 \rightarrow 0 \leq \sin^2 x \leq 1 \rightarrow -1 \leq -\sin^2 x \leq 0 \rightarrow 1 \leq -\sin^2 x + 1 \leq 1 \Rightarrow Ry = [1, 1]$ ✓

ب) $y = \frac{1 \cot x}{1 + \cot^2 x} = \frac{1 \frac{\cos x}{\sin x}}{\frac{1}{\sin^2 x}} = 1 \sin x = \sin x \Rightarrow -1 \leq \sin x \leq 1 \Rightarrow Ry = [-1, 1]$ ✓

الف) $y = \sin^4 x + \cos^4 x \rightarrow 1 \leq \sin^4 x + \cos^4 x \leq 1 \Rightarrow Ry = [1, 1]$ ✓

ب) $y = [\sin^4 x + \cos^4 x] \rightarrow 1 \leq \sin^4 x + \cos^4 x \leq 1 \Rightarrow Ry = [1, 1]$ ✓

الف) $y = \frac{1 \sin^2 x + 1 \cos^2 x - 1}{\sin x + 1} = \frac{(1+1)(\sin^2 x - 1)}{\sin x + 1} = 1 \sin x - 1 \xrightarrow{-1 \leq \sin x \leq 1} y \in [-2, 0]$ ✓

ب) $y = \frac{\sin^2 x - 1}{\sin x - 1} = \frac{(\sin x - 1)(\sin x + 1)}{\sin x - 1} = \sin x + 1 \xrightarrow{-1 \leq \sin x \leq 1} y \in [0, 2]$ ✓