نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

1

$y = \frac{x^2+x+2}{x-1} \Rightarrow yx - y = x^2+x+2 \Rightarrow x^2+(1-y)x+2+y$

$\Rightarrow \Delta \geq 0 \Rightarrow (1-y)^2 - 4(1)(2+y) \geq 0 \Rightarrow y^2+1-2y-8-4y \geq 0$

$\Rightarrow y^2-6y-7 \geq 0 \longrightarrow (y+1)(y-7) \geq 0 \quad \begin{array}{ccccc} & -1 & & 7 & \\ + & 0 & - & 0 & + \end{array} \quad \boxed{y \in \mathbb{R} - (-1,7)}$

2

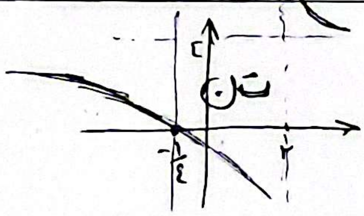
الف) $\frac{-\Delta}{4a} = \frac{-(5^2-4(3)(1))}{8} = \frac{-17}{8} \Rightarrow y \in [\frac{-17}{8}, +\infty)$

ب) $y^2 = -x^2+6x-5 \quad (y \geq 0) \quad \frac{-\Delta}{4a} = \frac{-(36-20)}{-4} = \frac{-16}{-4} = 4 \quad y^2 \leq 4 \Rightarrow 0 \leq y \leq 2$

د) $x^3 - 6x^2 + 7x + 4 \Rightarrow \underbrace{(x-4)}_{R=\mathbb{R}}\underbrace{(x^2-2x-1)}_{R=\mathbb{R}} \Rightarrow R = \mathbb{R}$

3

الف) $y = \frac{4x+1}{2x-6} \Rightarrow R_f = \mathbb{R} - \{\frac{4}{2}\}$



ب) $R_f \in (-\infty, 0] \cup (4, +\infty)$

ج) $\frac{x^2+3}{\sqrt{x^2+3}} + \frac{1}{\sqrt{x^2+3}} \Rightarrow y = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} \Rightarrow R = [\sqrt{3} + \frac{1}{\sqrt{3}}, +\infty)$

د) $x^2+4 + \frac{1}{x^2+4} \geq 4.25 \Rightarrow x^2+4+\frac{1}{x^2+4} - 4 \geq 0.25 \quad R \in [\frac{1}{4}, +\infty)$

5

روش اول) $y = \frac{2\sin x - 1}{\sin x + 3} \begin{cases} \sin = 1 \Rightarrow \frac{1}{4} \\ \sin = 0 \Rightarrow \frac{-3}{2} \end{cases}$ برد صورت سؤال: $[-\frac{3}{2}, \frac{1}{4}]$

روش دوم) $y = \frac{2\sin x - 1}{\sin x + 3} \Rightarrow y\sin x + 3y = 2\sin x - 1 \Rightarrow (y-2)\sin x = -1-3y$

$\Rightarrow \frac{-3y-1}{y-2} = \sin x \Rightarrow -1 \leq \frac{-3y-1}{y-2} \leq 1 \Rightarrow \frac{-3}{2} \leq y \leq \frac{1}{4}$

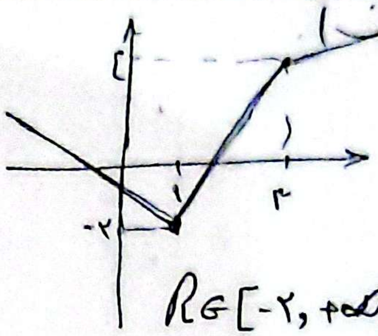
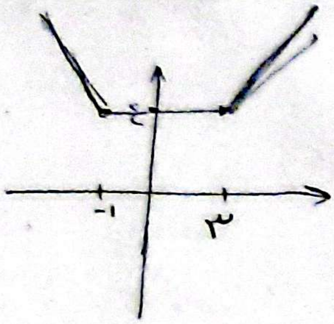
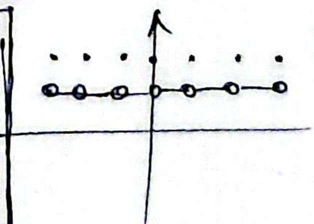
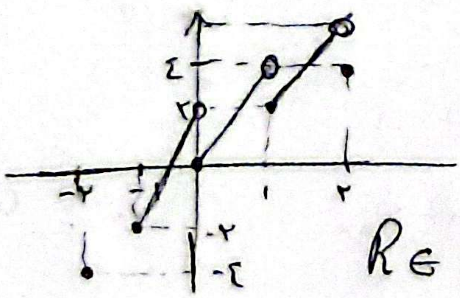
جای سوالات عوض شده

4

روش اول) $\frac{3x^2+4}{x^2-1} = y \Rightarrow yx^2 - y = 3x^2+4 \Rightarrow (3-y)x^2 + 4 + y = 0$

$\Delta \geq 0 \Rightarrow -4(3-y)(4+y) \geq 0 \Rightarrow y \geq 3 \quad y \leq -4 \Rightarrow R \in (-\infty, -4] \cup (3, +\infty)$

روش دوم) $\frac{3x^2+4}{x^2-1} \begin{cases} x^2 = +\infty \Rightarrow 3 \\ x^2 = 0 \Rightarrow -4 \end{cases}$ برد صورت سؤال $\Rightarrow (-\infty, -4] \cup (3, +\infty)$

مخرج الگوی تشابه => مخرج Δ $f(x) = \dfrac{t + \frac{1}{2}}{t+1}$ $\begin{cases} t = +\infty \Rightarrow 1 \\ t = -\frac{1}{2} \Rightarrow 0 \end{cases} \Rightarrow R \in [0,1]$	۶
الف)  $R \in [-2, +\infty)$ ب)  $R \in [4, +\infty)$	۷
$\|x-2\| - \|2x+2\| \leq 1$ -1 ، 2 : $x+4$ | $-3x$ | $-x-4$ $-x+4 \leq 1 \Rightarrow x \geq -6$ $-2x \leq 1 \Rightarrow x \geq \frac{1}{2}$ $\Rightarrow (-\infty, -3] \cup [\frac{1}{2}, +\infty)$ $x+4 \leq 1 \Rightarrow x \leq -3$	۸
الف) $[x] + [-x] + 3$  $R = \{2, 3\}$ ب)  $R \in [-2, 6) \cup \{-4\}$	۹
الف) $(\sin = -1) \Rightarrow 1+1+1 = 3$ $(\sin = 1) \Rightarrow 1(-1)+1 = 1$ $\sin = \frac{-b}{2a} = \frac{1}{4} - \frac{1}{2} + 1 = \frac{3}{4}$ $R \in [\frac{3}{4}, 3]$ ب) $(\sin^2 = 0) \Rightarrow 1$ $(\sin^2 = 1) \Rightarrow 3$ $R \in [1, 3]$ $(\sin^2 = \frac{-b}{2a}) = -\frac{1}{2} \longrightarrow$ غ ق ق	۱۰