

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره کلاس: و تاریخ:	۱
$f(-x) - x f(x) = 2 x + 1$ $\xrightarrow{-x} f(x) + x f(-x) = 2 x + 1$ $A = f(x)$ $B = f(-x)$ $\begin{cases} B - xA = 2 x + 1 \rightarrow B = xA + 2 x + 1 \\ A + xB = 2 x + 1 \end{cases}$ $\leftarrow$ مانند $A + x(2 x + 1 + xA) = 2 x + 1$ $A + x(2 x + 1) + x^2 A$ $(1 + x^2)A = (2 x + 1)(1 - x) \rightarrow f(x) = \frac{(2 x + 1)(1 - x)}{1 + x^2}$ $\rightarrow$ پاسخ	۲
$f(x) + f(0) = x^2 - 3x + 4 \Rightarrow f(x) + 3 = x^2 - 3x + 4 \rightarrow f(x) = x^2 - 3x + 1$ $\xrightarrow{x=0} f(0) = 4 \rightarrow f(0) = 3$ $\rightarrow f(x^2) = (x^2)^2 - 3x^2 + 1 = x^4 - 3x^2 + 1$	۳
$y = \frac{x^2 + x + 2}{x - 1} \rightarrow yx - y = x^2 + x + 2 \rightarrow x^2 + (1 - y)x + y + 2 = 0$ $\Delta \geq 0 \rightarrow (1 - y)^2 - 4(y + 2) \geq 0 \rightarrow 1 - 2y + y^2 - 4y - 8 \geq 0 \rightarrow y^2 - 6y - 7 \geq 0$ $(y - 7)(y + 1) \geq 0 \Rightarrow \begin{cases} y > 7 \\ y < -1 \end{cases} \Rightarrow R_f = (-\infty, -1] \cup [7, +\infty)$	۴
الف) $y = 2x^2 - 3x + 1$ $-\frac{b}{2a} = \frac{3}{4} \rightarrow y_s = -\frac{17}{8}$ $R_f = [-\frac{17}{8}, +\infty)$ ب) $y = \sqrt{x^2 + 4x - 4} \rightarrow R_f = [0, 4]$ $-\frac{b}{2a} = 2 \rightarrow y_s = 4$	۵
$y = \frac{x^2 + 1}{x^2 - 4} \rightarrow x = \frac{y^2 + 1}{y^2 - 3}$ $\rightarrow R_f = \mathbb{R} - \{\frac{3}{2}\}$ $y = \sqrt{\frac{5x+1}{2x-1}}$ $\rightarrow R - \{f\} \Rightarrow R_f = [0, +\infty) - \{f\}$	۶

$$y = \frac{3x^2 + 4}{x^2 - 1} \quad \begin{matrix} x=0 \rightarrow y = -4 \\ x=+\infty \rightarrow y = 3 \end{matrix} \xrightarrow{\text{ریشه منبری شود}} R_f = (-\infty, -4] \cup (3, +\infty)$$

$$y = \frac{3x^2 + 4}{x^2 - 1} \rightarrow y(x^2 - 1) = 3x^2 + 4$$

$$(y-3)x^2 = y+4$$

$$x^2 = \frac{y+4}{y-3} \quad \begin{matrix} x & | & -\infty & 3 & +\infty \\ y & | & +4 & -3 & +\infty \end{matrix} \Rightarrow R_f = (-\infty, -4] \cup (3, +\infty)$$

$$y = \frac{y \sin x + 4}{\sin x - 3} \quad \begin{matrix} \sin x = 1 \rightarrow y = \frac{4}{-2} = -2 \\ \sin x = -1 \rightarrow y = \frac{4}{-4} = -1 \end{matrix}$$

$$\xrightarrow{\text{منبری شود}} R_f = [-2, -1]$$

$$\text{الف) } y = \left| \frac{3x-1}{4x} \right| \quad x \geq 0 \rightarrow \frac{3x-1}{4x} = y \rightarrow x = \frac{1}{3-4y} \quad \begin{matrix} y \geq 0 \\ 3-4y > 0 \end{matrix} \Rightarrow y \leq \frac{3}{4}$$

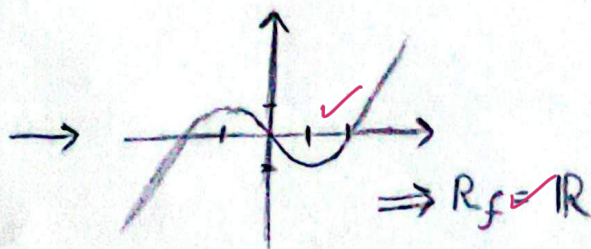
$$R_f = [0, \frac{3}{4}] \leftarrow (x = \frac{1}{6}) \text{ هم ممکن است } y = \frac{3}{4} \text{ باشد.}$$

$$\text{ب) } y = \sqrt{\frac{9x-11}{-1+4x}} = \sqrt{\frac{9(x-4)}{4(x-4)}} = \sqrt{\frac{9}{4}} = \frac{3}{2} \Rightarrow R_f = \left\{ \frac{3}{2} \right\}$$

$$y = x|x| - 2x$$

$$x \geq 0 \rightarrow y = x^2 - 2x$$

$$x < 0 \rightarrow y = -x^2 - 2x$$



$$\Rightarrow R_f = \mathbb{R}$$

$$y = f(x) \rightarrow$$

$$y = f(|x|)$$

$$y = f(|x|) + 1$$

$$y = |f(|x|) + 1|$$

