

19,5

مکرمه

ل. (ان شریفی)

تالیف شماره ۳

سوال ۱:

(۲)

$$f(-x) - xf(x) = 2|x| + 1 \xrightarrow{x} xf(-x) - x^2 f(x) = 2|x| + 1$$

$$-x^2 f(x) + xf(-x) = 2(1-x) + 1 \xrightarrow{x} -f(x) - xf(-x) = -2|x| - 1$$

$$f(x)(-x^2 - 1) = 2|x| + 1 - 2|x|$$

$$x > 0 \rightarrow f(x) = \frac{2x^2 - x - 1}{-x^2 - 1} \quad x < 0 \rightarrow \frac{-2x^2 + 3x - 1}{-x^2 - 1}$$

$$f(x) + f(0) = x^2 - 3x + 4$$

$$\hookrightarrow f(0) = 0 - 3 \cdot 0 + 4 - f(0)$$

$$x=0 \hookrightarrow 2f(0) = 4 \hookrightarrow f(0) = 2$$

$$f(x) = x^2 - 3x + 2 \hookrightarrow f(x^2) = x^4 - 3x^2 + 2$$

سوال ۲:

(۲)

$$y = \frac{x^2 + x + 2}{x-1} \xrightarrow{y} 2x - y = x^2 + x + 2$$

$$x^2 - yx + y + x + 2 = 0 \xrightarrow{x^2 + (-y)x + (y+2) = 0} \quad (۲)$$

$$x = \frac{y-1 \pm \sqrt{y^2 - 4y - 4}}{2}$$

$$\hookrightarrow R_f = \mathbb{R} - (-1, 1)$$

$$\Delta = (1-y)^2 - 4(y+2) = 1 - 2y + y^2 - 4y - 8 = y^2 - 6y - 7 = (y-7)(y+1)$$

سوال ۳:

(۲)

$$الف) y = 2x^2 - 4x + 1 \xrightarrow{x_2 = \frac{-b}{2a} = \frac{2}{2} = 1} y_2 = 2 \cdot 1^2 - 4 \cdot 1 + 1 = -1$$

صورتی

$$\hookrightarrow R = \left[-\frac{1}{2}, +\infty \right)$$

$$-\frac{4}{14} \xrightarrow{-\frac{4}{14} = -\frac{2}{7}} -\frac{1}{7}$$

$$ب) y = \sqrt{-x^2 + 4x - 4} \xrightarrow{\text{...}} x_2 = \frac{-4}{-2} = 2 \hookrightarrow y = -4 + 4 - 4 = -4$$

$$\sqrt{-\infty, 4} = [0, 2]$$

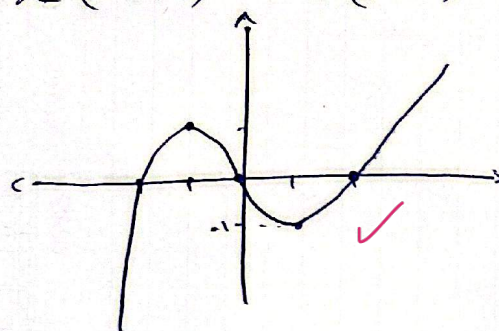
$$ج) y = \sqrt{x^2 - 3x + 1} \xrightarrow{2} [0, +\infty)$$

$$\hookrightarrow y \in \log(x^2 - 4x + 7x + 4) \xrightarrow{2} (-\infty, +\infty)$$

$$Y = x|x| - 2x$$

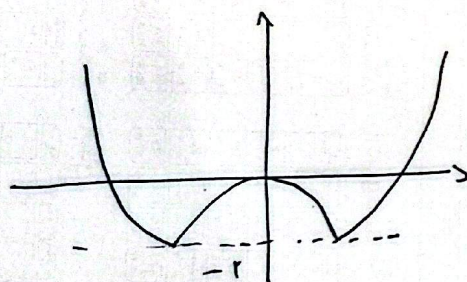
$x < 0$	$x \geq 0$
$-x^2 - 2x$	$x^2 - 2x \rightarrow (1, -1)$
$-x(x+2)$	$x(x-2)$

سوال 9: (2)



$$PR = \underline{1R}$$

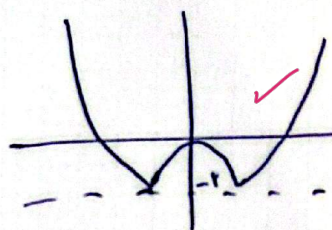
$$f(x) =$$



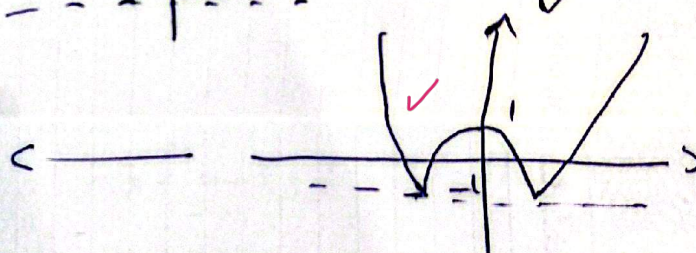
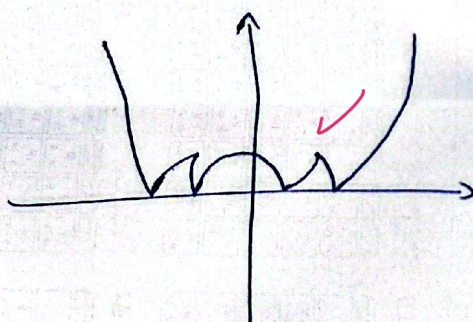
$$y = |f(|x| + 1)|$$

سوال 10: (2)

$$2, f(|x|) =$$



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



$$\text{روش اول: } y n^r - y = 3n^r + 4 \rightarrow (y - 3)n^r = y + 4$$

4

$$n^r = \frac{y + 4}{y - 3} \geq 0 \rightarrow \frac{-4}{+4} \frac{3}{+}$$

$$\Rightarrow R_y = (-\infty, -4] \cup (3, +\infty)$$

$$\text{روش دوم: } \square = n^r \rightarrow \begin{cases} n^r = 0 \rightarrow y = -4 \\ n^r \sim \infty \rightarrow y = 3 \end{cases} \xrightarrow[\text{محدوده}]{\text{محدوده میوه}} R_y = (-\infty, -4] \cup (3, +\infty)$$