نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۶ ..... کلاس ..... B .....

۱

الف) $x^3 - 3(x^2 - x) = y \Rightarrow x^3 = y + 3(x^2 - x) \Rightarrow x = \sqrt[3]{y + 3(x^2 - x)} \Rightarrow R_f = \mathbb{R}$

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

$x = \sqrt{\frac{1+y}{y}} + 1 \Rightarrow \frac{1+y}{y} \geq 0 \Rightarrow$ (-1, 0) $\Rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$

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الف) $-\frac{b}{2a} = \frac{4}{2} = 2 = x_s$, $-4 + 1 = 9 = y_s$ $\Rightarrow R_f = [9, +\infty)$

ب) $-\frac{b}{2a} = 3 = x_s$

$y_s = -9 + 18 + 3 = 12$

تابع $\Rightarrow$ max $\Rightarrow R_f = (-\infty, 12]$

ج) $-\frac{b}{2a} = 2 = x_s$

$y_s = -4 - 3 = -7 = y_s$ $\Rightarrow R_f = [0, +\infty)$

د) $\frac{-4}{-2} = 2 = x_s$

$y_s = 9$ $\Rightarrow R_f = [0, 9]$

۳

الف) $y = x^3 - 5x^2 + 2x + 1 \Rightarrow R_f = \mathbb{R}$

ب) $y = x^7 - 4x^4 + 3x + 2 \Rightarrow R_f = \mathbb{R}$

ج) $y = \sqrt{x^7 - 4x^2 - 5x + 1} \Rightarrow R_f = [0, +\infty)$

د) $y = (x^5 - 4x^3 + 3x + 1)^2 \Rightarrow R_f = [0, +\infty)$

۴

الف) $R_f = \mathbb{R} - \{3\}$

ب) $R_f = \mathbb{R} - \{2\}$

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

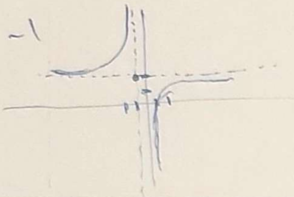
ب) $y^2 = \frac{3x+1}{-x+2} \Rightarrow x = \frac{-2y^2 + 1}{-y^2 - 3} \Rightarrow \neq 0 \Rightarrow R_f = \mathbb{R}$

۶

الف) $y = \frac{2x-3}{x+1}$

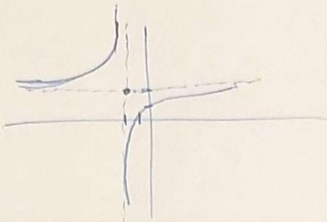
مجانب افقی $= \frac{a}{c} = 2$

مجانب عمودی $= -1$



ب) مجانب افقی $= \frac{a}{c} = 2$

مجانب عمودی $= -2$



۷

الف) $y = \sin x + \frac{1}{\sin x} \Rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

ب) $\frac{x^6}{x^3} + \frac{1}{x^3} = x^3 + \frac{1}{x^3} \Rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

ج) $\frac{x^{\frac{2}{3}}}{x^{\frac{1}{3}}} + \frac{1}{x^{\frac{1}{3}}} \Rightarrow x^{\frac{1}{3}} + \frac{1}{x^{\frac{1}{3}}} \Rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

د) $y = \sqrt{x} + \frac{1}{\sqrt{x}} \Rightarrow R_f = [2, +\infty)$

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

$x = \frac{-(3-y) \pm \sqrt{\Delta}}{2} \Rightarrow \Delta \geq 0 \Rightarrow (3-y)^2 - 4(1-3y) \geq 0 \Rightarrow y^2 + 6y + 5 \geq 0 \Rightarrow$

$(y+5)(y+1) \geq 0 \Rightarrow$

y	+	-5	−	-1	+

$\Rightarrow R_f = (-\infty, -5] \cup [-1, +\infty)$

ب) $y^2(x^2+4) = (x^2+5)^2 \Rightarrow x^4 + x^2(10 - y^2) + 25 - 4y^2 = 0 \Rightarrow \Delta \geq 0 \Rightarrow (10 - y^2)^2 - 4(25 - 4y^2) \geq 0 \Rightarrow y^4 - 4y^2 \geq 0$

$(y^2 - 2y)(y^2 + 2y) = (y(y-2))(y(y+2)) \Rightarrow$

	+	-2	−	0	−	2	+

جواب $\rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

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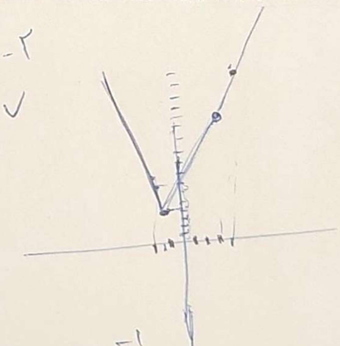
$y = |x - 3| + |3x + 4| \Rightarrow$

$x - 3 + 3x + 4 \rightarrow x \geq 3 \Rightarrow 4x + 1$

$-x + 3 + 3x + 4 \rightarrow -\frac{4}{3} \leq x < 3 \Rightarrow 2x + 7$

$-x + 3 - 3x - 4 \Rightarrow x < -\frac{4}{3} \Rightarrow -4x - 1$

4	3	$-\frac{4}{3}$	-2
17	13	$\frac{13}{3}$	7



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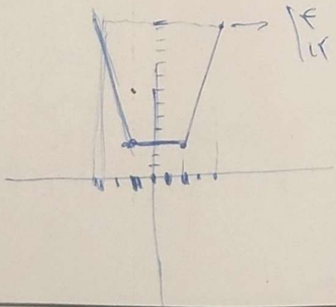
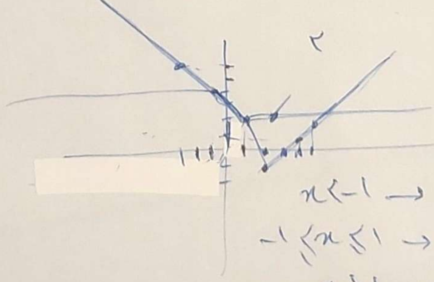
$y = |x - 2| + |2x + 2|$



ب) $y = |2x - 2| - |x + 1|$



$x < -1 \rightarrow -x + 3 \rightarrow 4$

$-1 \leq x \leq 1 \rightarrow -3x + 1$

$x \geq 1 \rightarrow x - 3$