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

۱

الف) $y = x^2 - 5$

$x^2 = y + 5$

$x = \sqrt{y+5}$

$y + 5 \geq 0$

$y \geq -5$

$R = [-5, +\infty)$

ب) $y = x^3 + 1$

$x^3 = y - 1$

$x = \sqrt[3]{y-1}$

$R_f = \mathbb{R}$

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الف) $y = x^2 - 4x + 4$

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

$(x-2)^2 = y - 2$

$x - 2 = \sqrt{y-2}$

$x = \sqrt{y-2} + 2$

$y - 2 \geq 0$

$y \geq 2$

$R_f = [2, +\infty)$

ب) $y = x^2 - 5x + 1$

$y = (x - \frac{5}{2})^2 + 1 - \frac{25}{4}$

$y + \frac{21}{4} = (x - \frac{5}{2})^2$

$x - \frac{5}{2} = \sqrt{y + \frac{21}{4}}$

$x = \sqrt{y + \frac{21}{4}} + \frac{5}{2}$

$y + \frac{21}{4} \geq 0$

$y \geq -\frac{21}{4}$

$R = [-\frac{21}{4}, +\infty)$

۳

الف) $y = \frac{x^2+3}{x^2-2}$

$yx^2 - 2y = x^2 + 3$

$x^2(y-1) = 3 + 2y$

$x^2 = \frac{3+2y}{y-1}$

$x = \sqrt{\frac{3+2y}{y-1}}$

$yx^2 - x^2 = 2y + 3$

$\frac{-\frac{3}{2}}{+} \quad \frac{1}{-} \quad +$

$\frac{3+2y}{y-1} \geq 0$

$R = (-\infty, -\frac{3}{2}] \cup (1, +\infty)$

ب) $y = \frac{2|x|+1}{|x|-2}$

$y|x| - 2y = 2|x| + 1$

$|x|(y-2) = 1 + 2y$

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

$\frac{-\frac{1}{2}}{+} \quad \frac{2}{-} \quad +$

$R = (-\infty, -\frac{1}{2}] \cup (2, +\infty)$

۴

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

$yx^2 - 2yx = 1$

$yx^2 - 2yx - 1 = 0$

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

$y \neq 0$

$4y^2 + 2y \geq 0$

$2y(2y+1) \geq 0$

$\frac{-\frac{1}{2}}{+} \quad \frac{0}{-} \quad +$

$R = (-\infty, -\frac{1}{2}] \cup (0, +\infty)$

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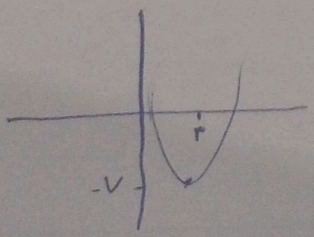
الف) $y = x^2 - 6x + 2$

$\frac{-b}{2a} = \frac{6}{2} = 3$

-7

$R = [-7, +\infty)$

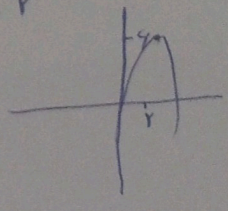


ب) $y = -x^2 + 4x + 2$

$\frac{-b}{2a} = \frac{-4}{-2} = 2$

6

$R = (-\infty, 6]$



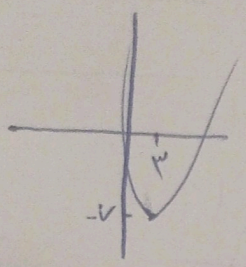
۶

الف) $y = \sqrt{x^2 - 6x + 2}$

$\left| \begin{matrix} \frac{-b}{2a} = \frac{6}{2} = 3 \\ -7 \end{matrix} \right.$

$\sqrt{[-7, +\infty)}$

$\Rightarrow \sqrt{[0, +\infty)} \Rightarrow \boxed{R_f = [0, +\infty)}$

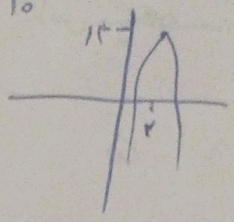


ب) $y = \sqrt{-x^2 + 4x + 12}$

$\left| \begin{matrix} \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ 16 \end{matrix} \right.$

$\sqrt{(-\infty, 16]}$

$\Rightarrow (-\infty, \sqrt{16}] \Rightarrow R_f = (-\infty, \sqrt{16}]$



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الف) $y = x^5 + 2x^4 + 2x + 1$

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

ب) $y = \sqrt{x^6 + 2x^4 + 4x + 1}$

$\sqrt{\mathbb{R}} \Rightarrow \boxed{R = [0, +\infty)}$

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الف) $y = \frac{3x + 1}{x - 2}$

$R_f = \mathbb{R} - \{3\}$

ب) $y = \sqrt{\frac{4x + 1}{x + 3}}$

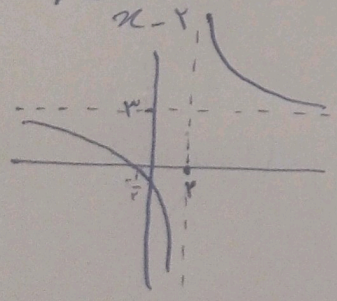
$R_f = \mathbb{R} - \{\sqrt{4}\} = \mathbb{R} - \{2\}$

۹

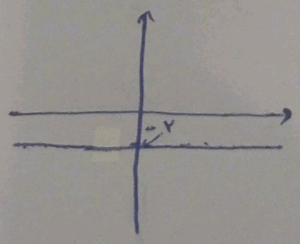
الف) $\frac{3x + 1}{x - 2}$

مجانب قائم $= 2$

مجانب افقی $= 3$



ب) $\frac{4x - 2}{1 - 2x} = \frac{2(2x - 1)}{-(2x - 1)} = -2$



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الف) $y = \cos^2 x + \frac{1}{\cos^2 x}$

$\boxed{R_f = [2, +\infty)}$

ب) $y = \sqrt[3]{\frac{x^2 + 1}{x^6}}$

$y = \sqrt[3]{x + \frac{1}{x}} \Rightarrow$ چون عدد زیر رادیکال x و $\frac{1}{x}$ دارد

$\boxed{R_f = (-\infty, -2] \cup [2, +\infty)}$