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نام و نام خانوادگی: فرزند: پاسخنامه تشریحی تکلیف شماره ۹ کلاس: (روز جمعه)

۱) الف) $y = x^2 - 8 \rightarrow y + 8 = x^2 \rightarrow \sqrt{y+8} = x \rightarrow y+8 \geq 0 \rightarrow y \geq -8 \rightarrow R_f = [-8, +\infty)$

ب) $y = x^3 + 1 \rightarrow y - 1 = x^3 \rightarrow x = \sqrt[3]{y-1} \rightarrow R_f = \mathbb{R}$

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۲) الف) $y = (x^2 - 2x + 2) \rightarrow y = (x-1)^2 + 1 \rightarrow y-1 = (x-1)^2 \rightarrow \sqrt{y-1} = x-1 \rightarrow y-1 \geq 0 \rightarrow y \geq 1 \rightarrow R_f = [1, +\infty)$

ب) $y = x^2 - 2x + 1 \rightarrow x^2 - 2x + 1 - y = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow 4 - 4(1-y) = 0 \rightarrow 4 - 4 + 4y = 0 \rightarrow 4y = 0 \rightarrow y = 0$

$R_f = [-\frac{1}{4}, +\infty)$

۳) الف) $y = \frac{x^2 + 3}{x^2 - 2} \rightarrow y(x^2 - 2) = x^2 + 3 \rightarrow yx^2 - 2y = x^2 + 3 \rightarrow yx^2 - x^2 = 2y + 3 \rightarrow x^2(y-1) = 2y+3 \rightarrow x^2 = \frac{2y+3}{y-1} \rightarrow \frac{2y+3}{y-1} \geq 0$

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

ب) $y = \frac{x^2 + 3}{x^2 - 2} \rightarrow y(x^2 - 2) = x^2 + 3 \rightarrow yx^2 - 2y = x^2 + 3 \rightarrow yx^2 - x^2 = 2y + 3 \rightarrow x^2(y-1) = 2y+3 \rightarrow x^2 = \frac{2y+3}{y-1} \rightarrow \frac{2y+3}{y-1} \geq 0$

۴) الف) $y = \frac{1}{x^2 - 2x} \rightarrow y(x^2 - 2x) = 1 \rightarrow ax^2 + bx + c = 0 \rightarrow a = y, b = -2y, c = 1 \rightarrow \Delta = b^2 - 4ac \rightarrow 4y^2 - 4y = 0 \rightarrow 4y(y-1) = 0 \rightarrow y = 0 \text{ or } y = 1$

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

۵) الف) $y = x^2 - 4x + 2 \rightarrow a = 1 \rightarrow a > 0 \rightarrow \min \left| \begin{array}{l} x_{\min} \rightarrow -\frac{b}{2a} \rightarrow 2 \\ y_{\min} \rightarrow -\frac{b^2}{4a} \rightarrow -2 \end{array} \right. \rightarrow R_f = [-2, +\infty)$

ب) $y = -x^2 + 2x + 2 \rightarrow a = -1 \rightarrow a < 0 \rightarrow \max \left| \begin{array}{l} x_{\max} \rightarrow -\frac{b}{2a} \rightarrow 1 \\ y_{\max} \rightarrow \frac{b^2}{4a} \rightarrow 4 \end{array} \right. \rightarrow R_f = (-\infty, 4]$

$(-\infty, +12] \xrightarrow[\text{بالدالة}]{\text{بمبدأ: إذا}} [0, +\sqrt{12}] \leftarrow \text{مبدأ: إذا}$

الف) $y = x^V + x^E + 4n + 1 \rightarrow PR - \boxed{1R}$

•) $y = \sqrt{n^2 + \{n^2 + 4n + 1\}} \rightarrow \sqrt{16} \rightarrow \boxed{[1, +\infty) \leftarrow \mathbb{R}_E}$

الف) $y = \frac{a^b}{(1+n)^c}$ $\sim R - \left\{ \frac{a}{c} \right\} \rightarrow \boxed{R - \{r\} = R_R}$

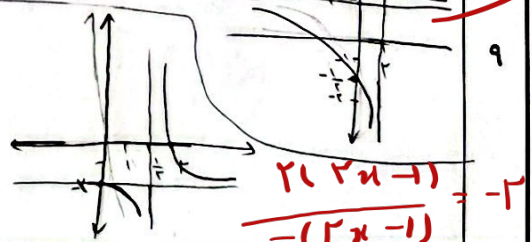
$$\frac{1}{2}) \quad y = \sqrt{\frac{x+1}{x+3}} \rightarrow R_F = 1R - \{x\} \xrightarrow{\text{differential}} R_F = [., +\infty) - \{x\}$$

$$y = \frac{x+1}{x-2} \rightarrow \begin{cases} x=0 \rightarrow y = -\frac{1}{2} \\ x=4 \rightarrow y = 2 \end{cases} \rightarrow \begin{matrix} \text{نقطهٔ مرجع} \rightarrow \text{جانب بالا} \\ \text{نقطهٔ انحناء} \rightarrow \text{جانب بالا} \end{matrix}$$

$$\therefore y = \frac{\sum_{n=1}^{\infty} x^n}{1-x} \rightarrow \frac{\sum_{n=1}^{\infty} x^n}{1-x} \rightarrow \begin{cases} 1 \sim \boxed{x = \frac{1}{x}} \\ \infty \sim \frac{1}{-1} = -1 \end{cases}$$

$$x = 0 \rightarrow \frac{-r}{1} \rightarrow (-1) = y$$

$$y = 2 \rightarrow (x = 4)$$



الف) $y = \frac{\cos x}{x} + \frac{1}{\cos x} \rightarrow R_R = [r, +\infty)$

ب) $y = \sqrt{\frac{x+1}{x}}$ $\rightarrow \frac{x(n+\frac{1}{n})}{x} \rightarrow \textcircled{n} + \frac{1}{\textcircled{n}} \rightarrow R_F = [-\infty, -1] \cup [1, +\infty)$
 $x > 0 \rightarrow (\sqrt{x} + \infty)$
 $x < 0 \rightarrow (-\infty, \sqrt{-x})$