۱۴٫۵

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۹ ..... کلاس .....

الف) $y = x^2 - 5 \to y + 5 = x^2 \to \sqrt{y+5} = x \to y + 5 \geq 0 \Rightarrow y \geq -5$

$R_f = [-5, +\infty)$ ✓

ب) $y = x^2 + 1 \to y - 1 = x^2 \to \sqrt[2]{y-1} = x \Rightarrow R_f = \mathbb{R}$ ✓ (۲)

الف) $y = x^2 - 4x + 4 \to y = (x-2)^2 + 2 \Rightarrow y - 2 = (x-2)^2 \Rightarrow \sqrt{y-2} + 2 = x \Rightarrow$

$R_f = [2, +\infty)$ ✓ (۱٫۷۵)

ب) $y = x^2 - 5x + 1 \to 0 = x^2 - 5x + (1-y) \Rightarrow \Delta = b^2 - 4ac = 21 + 4y$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} \to \frac{5 \pm \sqrt{21+4y}}{2} \Rightarrow 21 + 4y \geq 0 \Rightarrow \frac{21}{4} \geq y \Rightarrow R_f = (-\infty, \frac{21}{4}]$ ✓

$R_f = [-\frac{21}{4}, +\infty) \to y \geq -\frac{21}{4}$

الف) $x^2 - yx^2 = -2y - 2 \to x^2(1-y) = -2y - 2 \to$

| | $-\frac{1}{2}$ | | $1$ | |
|---|---|---|---|---|
| | + | 0 | − | + |

$\Rightarrow R_f = [-\frac{1}{2}, 1)$ $R_f = (-\infty, -\frac{11}{2}] \cup (1, +\infty)$ (۱٫۵)

ب) $2|x| + 1 = y|x| - 4y \to 2|x| - y|x| = -4y - 1 \to |x|(2-y) = -4y - 1$

$|x| = \frac{-4y-1}{2-y} \Rightarrow$

| | $-\frac{1}{4}$ | | $2$ | |
|---|---|---|---|---|
| | − | 0 | + | − |

$\Rightarrow R_f = (-\infty, -\frac{1}{4}] \cup (2, +\infty)$ ✓

$y = \frac{1}{x^2 - 4x} \Rightarrow yx^2 - 4yx - 1 = 0 \Rightarrow \frac{-b \pm \sqrt{\Delta}}{2a}$ $\Delta = b^2 - 4ac$ (۱)

$\frac{4y \pm \sqrt{16y^2 + 4y}}{2a} \Rightarrow 16y^2 + 4y \geq 0 \Rightarrow 4y(4y+1) \geq 0 \Rightarrow 4y + 1 \geq 0 \Rightarrow$

| | $-\frac{1}{4}$ | | $0$ | |
|---|---|---|---|---|
| | + | 0 | − | + |

$4y \geq -1 \Rightarrow y \geq -\frac{1}{4} \Rightarrow R_f = [-\frac{1}{4}, +\infty)$ $R_f = (-\infty, -\frac{1}{4}] \cup (0, +\infty)$

الف) $y = x^2 - 6x + 2 \to \frac{-b}{2a} \to \frac{6}{2} = 3 \xrightarrow{\text{exp}} \begin{cases} 3 \\ -7 \end{cases} \to y_{min} = -7 \to$

$R_f = [-7, +\infty)$ ✓ (۲)

ب) $y = -x^2 + 4x + 2 \to -\frac{b}{2a} \to \frac{-4}{-2} = 2 \Rightarrow \text{exp} \begin{cases} 2 \\ 6 \end{cases} \to y_{max} = 6$

$R_f = (-\infty, 6]$ ✓

الف) $\sqrt{x^2-4x+2} \rightarrow -\frac{b}{2a}=2 \Rightarrow ext\begin{cases}2\\-7\end{cases} \rightarrow \sqrt{[-7,+\infty)} = [0,+\infty)$ $R_f$

ب) $\sqrt{-x^2+4x+12} \rightarrow -\frac{b}{2a}=2 \Rightarrow ext\begin{cases}2\\12\end{cases} \rightarrow \sqrt{(-\infty,12]} = [0,\sqrt{12}]$ $R_f$

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الف) $y=x^7+2x^4+2x+1 \rightarrow R_f=\mathbb{R}$

ب) $y=\sqrt{x^5+4x^2+2x+1} \rightarrow R_f=[0,+\infty)$

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

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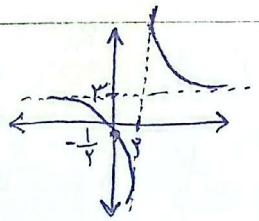
ب) $y=\sqrt{\frac{4x+1}{x+2}} \rightarrow R_f=(-\infty,-2)\cup(-1,+\infty)$

$R_f=\mathbb{R}-\{4\}$ ارتباط $\rightarrow R_f=[0,+\infty)-\{2\}$

الف) $y=\frac{2x+1}{x-2} \rightarrow \begin{matrix}2:\text{عدد}\\2=\frac{a}{c}\end{matrix} \Rightarrow$

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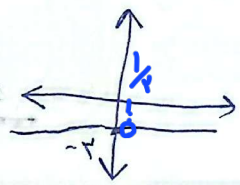
ب) $y=\frac{4x-2}{1-2x} \rightarrow y=\frac{2(2x-1)}{-(2x-1)}=-2 \rightarrow \boxed{y=-2}$




$x\neq 1/2$

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الف) $\cos^2 x+\frac{1}{\cos^2 x} \Rightarrow R_f=[2,+\infty)$

ب) $x+\frac{1}{x}\begin{cases}x>0 \rightarrow x+\frac{1}{x}\geq 2 & [2,+\infty)\\ x<0 \rightarrow x+\frac{1}{x}\leq -2 & (-\infty,-2]\end{cases} \Rightarrow \sqrt{(-\infty,-2]\cup[2,+\infty)}$ $R_f$

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