

نام و نام خانوادگی: ... پاسخنامه تشریحی تکلیف شماره 4 ... کلاس: ...

الف) $y = x^3 - 12x^2 + 12x = x(x^2 - 12x + 12)$ $\Delta \leftarrow$ $R_f = \mathbb{R}$

ب) $y = \frac{x^2 - 1}{x^2 - 2x} \Rightarrow yx^2 - 1 = 0$
 $x = \frac{1 \pm \sqrt{1 + 4y}}{2y}$ $\frac{1 \pm \sqrt{1 + 4y}}{2y} \geq 0$
 $\frac{1}{2y} \pm \frac{\sqrt{1 + 4y}}{2y} \geq 0$
 $\frac{1 \pm \sqrt{1 + 4y}}{2y} \geq 0$
 $R_f = (-\infty, -1] \cup (0, +\infty)$

الف) $y = x^2 - 4x + 10$ $\min \left| \frac{b}{2a} = \frac{4}{2} = 2 \right|$ $R_f = [4, +\infty)$
 $f - 4 + 10 = 6$

ب) $y = -x^2 + 4x + 12$ $\min \left| \frac{b}{2a} = \frac{4}{-2} = -2 \right|$ $R_f = (-\infty, 12]$
 $-4 + 12 + 12 = 20$

ج) $y = \sqrt{x^2 - 4x - 12}$ $\min \left| \frac{b}{2a} = \frac{4}{2} = 2 \right|$ $R_f = \sqrt{[-7, +\infty)} = [0, +\infty)$
 $f - 4 - 12 = -8$

د) $y = \sqrt{4x - x^2}$ $\min \left| \frac{b}{2a} = \frac{4}{-2} = -2 \right|$ $R_f = \sqrt{(-\infty, 4]} = [0, 2]$
 $12 - 4 = 8$

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

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

ج) $y = \sqrt{x^3 - 4x^2 + 5x + 1}$ $R_f = \sqrt{\mathbb{R}} = [0, +\infty)$

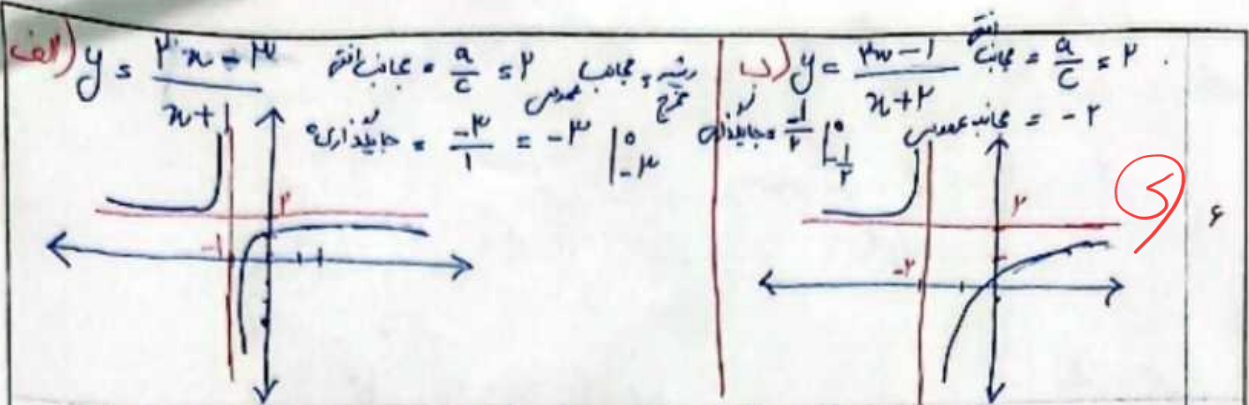
د) $y = (x^2 - 4x^2 + 3x + 1)^2$ $R_f = (\mathbb{R})^2 = [0, +\infty)$

الف) $y = \frac{3x+1}{x-2}$ $R_f = \mathbb{R} - \{2\}$ $\frac{a}{c} = 3$

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

الف) $y = \sqrt{\frac{2x+4}{x+1}}$ $R_f = \sqrt{\mathbb{R} - \{2\}} = [0, +\infty) - \{\sqrt{2}\}$

ب) $y = \sqrt{\frac{3x+1}{-x+2}}$ $R_f = \sqrt{\mathbb{R} - \{2\}} = [0, +\infty)$



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

ب) $y = \frac{x^4 + 1}{x^2} = x^2 + \frac{1}{x^2} \Rightarrow R_f = (-\infty, -1] \cup [1, +\infty)$

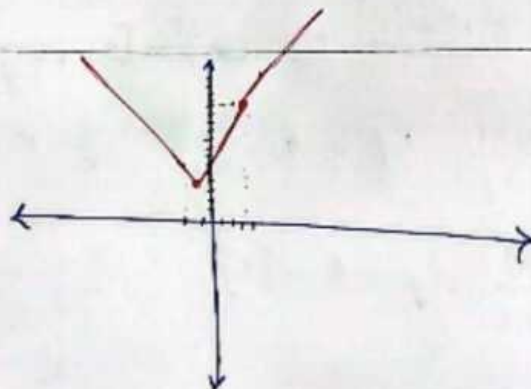
ج) $y = \frac{\sqrt[3]{x^3 + 1}}{\sqrt[3]{x}} = \sqrt[3]{\frac{x^3 + 1}{x}} = \sqrt[3]{x + \frac{1}{x}} \Rightarrow R_f = (-\infty, -1] \cup [1, +\infty)$

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

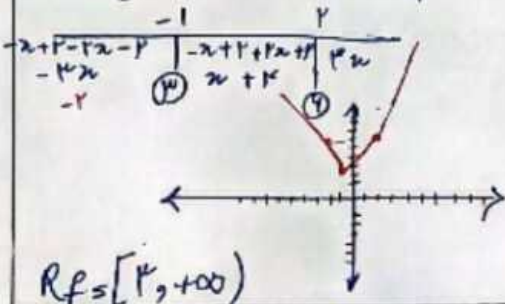
الف) $y = \sqrt{x^2 + 1} + \frac{1}{\sqrt{x^2 + 1}} \Rightarrow R_f = [\frac{1}{\sqrt{2}}, +\infty)$

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

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



الف) $y = |x - 1| + |x + 1|$



ب) $y = |x - 1| - |x + 1|$

