

الف) $y = \sqrt{x^2 - 6x + 2} \rightarrow a > 0$ $x = -\frac{b}{2a} \rightarrow -\frac{-6}{2} = 3$ $y = 3^2 - 6 \cdot 3 + 2 = -7$
 $\sqrt{[-7, +\infty)} \rightarrow R_f = [0, +\infty)$

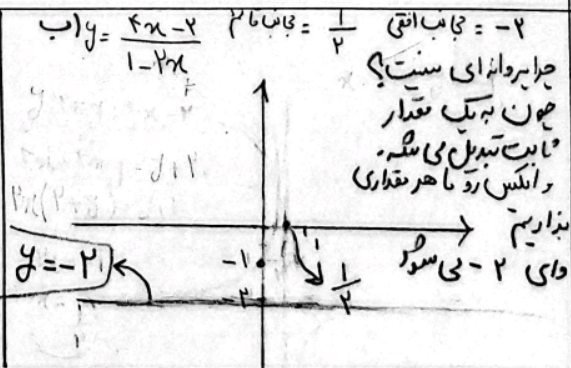
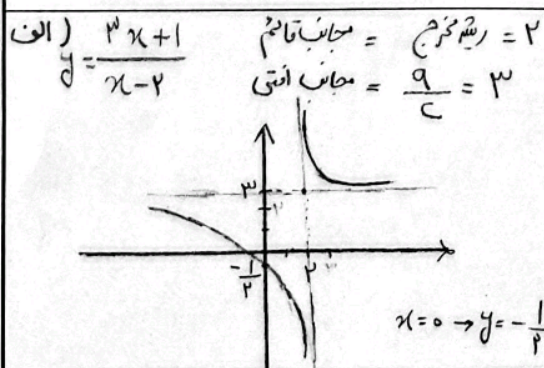
ب) $y = \sqrt{-x^2 + 4x + 10} \rightarrow a < 0$ $(\max) \rightarrow x = -\frac{b}{2a} \rightarrow \frac{-4}{-2} = 2$
 $y = -\frac{(2)^2}{-2} + \frac{4 \times 2}{1} + 10 = 14 \rightarrow \sqrt{(-\infty, 14]} \rightarrow R_f = [0, 14]$

الف) $y = x^3 + 3x^2 + 2x + 1$ $R_f = \mathbb{R}$ چون بزرگترین توان مافرد است پس است
 $R_f = \mathbb{R}$

ب) $y = \sqrt{x^3 + 2x^2 + 4x + 1} \rightarrow \sqrt{\mathbb{R}} \rightarrow R_f = [0, +\infty)$
 چون در زیر رادیکال نمی تواند منفی باشد پس $R_f = [0, +\infty)$

الف) $y = \frac{3x+1}{x-2}$ $3x-2 \neq 1 \times 1 \rightarrow R_f = \mathbb{R} - \left\{ \frac{3}{1} \right\}$
 $\rightarrow R_f = \mathbb{R} - \{3\}$

ب) $y = \sqrt{\frac{4x+1}{x+3}}$ $3 \times 4 \neq 1 \times 1 \checkmark \sqrt{\mathbb{R} - \left\{ \frac{4}{1} \right\}} \rightarrow R_f = [0, +\infty) - \{4\}$



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

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