

$$\rightarrow x^2 = y - 1 \Rightarrow x = \sqrt{y - 1} \Rightarrow R_f = 1R$$

$$\Delta = b^r - r a c \Rightarrow (-a)^r - (r \times (1) \times (1-y)) \Rightarrow r a + r y - r \Rightarrow$$

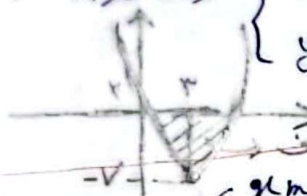
$$\rightarrow y|x| - xy = x|x|+1 \Rightarrow y|x| - x|x| = xy+1 \Rightarrow |x|(y-x) = xy+1 \Rightarrow$$

$$|x| = \frac{xy+1}{y-x} \Rightarrow \frac{+ \frac{1}{x} - \frac{1}{x}}{\frac{1}{x} - \frac{1}{x}} \Rightarrow R_f = (-\infty, -\frac{1}{f}] \cup (\frac{1}{f}, +\infty)$$

$f_y(f_y+1) \geq 0 \Rightarrow f_y \geq 0 \Rightarrow y \geq 0 \xrightarrow{n} y \geq 0$ $f_y \leq 0 \Rightarrow y \leq 0 \xrightarrow{n} y \leq -\frac{1}{f}$
 $f_y+1 \geq 0 \Rightarrow y \geq -1$ $f_y+1 \leq 0 \Rightarrow y \leq -\frac{1}{f}$
 چون $y = \frac{1}{x^2 - 4x} \Rightarrow x^2 - 4x = \frac{1}{y} \Rightarrow y \neq 0 \Rightarrow R_f = y > 0 \cup y \leq -\frac{1}{f} = (-\infty, -\frac{1}{f}] \cup (0, \infty)$

$\Rightarrow R_f = (-\infty, 4]$

الف) $a > 0 \Rightarrow \begin{cases} x_{\min} = \frac{-b}{2a} \Rightarrow \frac{-(-4)}{2} = 2 \\ y_{\min} = -1 \end{cases} \Rightarrow R_f = \sqrt{[-1, +\infty)} = [0, +\infty)$



ب) $a < 0 \Rightarrow \begin{cases} x_{\max} = \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ y_{\max} = 1 \end{cases} \Rightarrow R_f = \sqrt{(-\infty, 1]} = [0, \sqrt{1}]$



بالا محدود است -> چون مثبت -> حریف

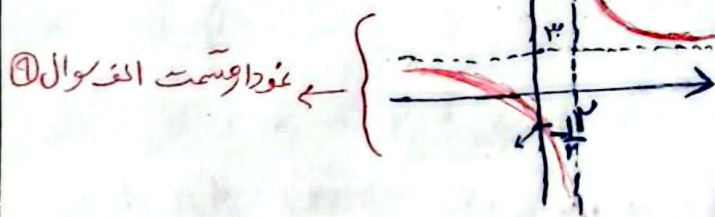
الف) $\Rightarrow R_f = \mathbb{R}$ بزرگترین آن ها فرد $\Rightarrow$ (کبرای است) $= \sqrt{\quad}$ بزرگترین توان آن

ب) $\sqrt{\mathbb{R}} = \sqrt{(-\infty, +\infty)} = [0, +\infty) \Rightarrow R_f = [0, +\infty)$

الف) $y = \frac{4x+1}{1x-2} \Rightarrow a=3, c=1 \Rightarrow \frac{a}{c} = \frac{3}{1} = 3 \Rightarrow R_f = \mathbb{R} - \{3\}$

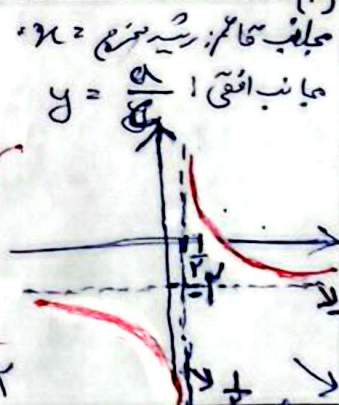
ب) $y = \sqrt{\frac{4x+1}{1x+2}} \Rightarrow a=4, c=1 \Rightarrow \frac{a}{c} = \frac{4}{1} = 4 \Rightarrow R_f = \sqrt{\mathbb{R} - \{4\}} = \sqrt{(-\infty, +\infty) - \{4\}}$

الف) $y = \frac{4x+1}{1x-2} \Rightarrow$ $y = \frac{4}{1} = 4$ و $y = 2$ میانبر است



ب) نمودار قسمت الف سوال ۱

نمودار قسمت ب سوال ۱



ب) $y = \frac{4x-2}{1-2x} \Rightarrow x = 2x-2=0 \Rightarrow x \neq \frac{1}{2}$ و $y = \frac{a}{c} = \frac{4}{-2} = -2$

الف) $\cos^2 x \geq 0 \Rightarrow R_f = [2, +\infty)$

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