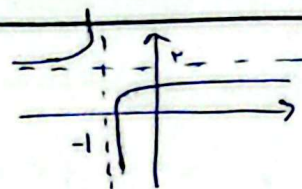
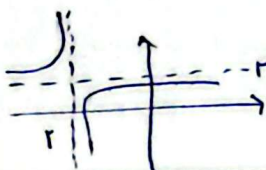


$$y = \frac{rx - r}{x+1} \quad \begin{cases} \text{if } x \geq -1 \\ \text{if } x < -1 \end{cases}$$


$$y = \frac{rx - 1}{x+r} \quad \begin{cases} \text{if } x \geq -r \\ \text{if } x < -r \end{cases}$$


الف) $y = \sin x + \frac{1}{\sin x} \Rightarrow \begin{cases} \text{if } a > 0 \Rightarrow \sin x + \frac{1}{\sin x} \geq 2 \\ \text{if } a < 0 \Rightarrow \sin x + \frac{1}{\sin x} \leq -2 \end{cases} \quad R_f = (-\infty, -2] \cup [2, +\infty)$

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

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

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

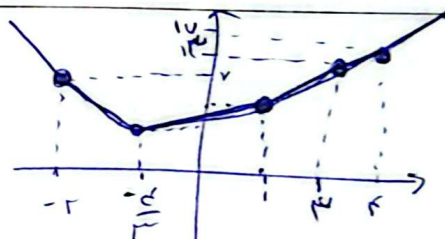
هـ) $y = x^r + \frac{1}{x^r + r} \Rightarrow y = \frac{x^r + r x^r}{x^r + r} \Rightarrow \frac{x^r (x^r + r)}{x^r + r} \Rightarrow x^r \Rightarrow [0, +\infty)$

و) $y = \frac{x^r + c}{\sqrt{x^r + c}} \Rightarrow \frac{x^r + c + 1}{\sqrt{x^r + c}} \Rightarrow \frac{x^r + c + 1}{\sqrt{x^r + c}} \Rightarrow \frac{1}{\sqrt{x^r + c}} \Rightarrow$

$\sqrt{x^r + c} + \frac{1}{\sqrt{x^r + c}} \xrightarrow{x \rightarrow \infty} \sqrt{c} + \frac{1}{\sqrt{c}} \Rightarrow [\frac{\infty}{\sqrt{c}}, +\infty)$

$$y = |x - r| + |rx + c|$$

$$\begin{cases} x - r + rx + c \leq x + 1 & x \geq r \\ r - x + rx + c \leq rx - 1 & -\frac{c}{r} \leq x \leq r \\ -x + r + rx - c \leq -cx - 1 & x < -\frac{c}{r} \end{cases}$$



الف) $y = |x - r| + |rx + r|$

$$\begin{cases} -x + r - rx - r \leq -rx & x < -1 \\ -x + r + rx + r \leq rx + c & -1 \leq x \leq r \\ x - r + rx + r \leq rx & r < x \end{cases}$$

