

$$\text{ا) } |x|^2 = y + 1 \quad x = \pm \sqrt{y+1} \quad R_f = [-1 + \infty) \quad -\text{ع}$$

$$\text{ب) } x^2 = y - 1 \quad x = \pm \sqrt{y-1} \rightarrow R_f = \mathbb{R}$$

$$\text{ج) } y = x^2 - 2x + 1 \Rightarrow y = (x-1)^2 + 1 \Rightarrow (x-1)^2 = y-1 \Rightarrow x-1 = \sqrt{y-1} \Rightarrow x = \sqrt{y-1} + 1$$

$$R_f = [1 + \infty)$$

$$\text{د) } y = x^2 - 2x + 1 \Rightarrow (x^2 - 2x + \frac{1}{4}) - \frac{1}{4} + 1 = y \Rightarrow y = (x - \frac{1}{2})^2 - \frac{1}{4} + 1 = (x - \frac{1}{2})^2 + \frac{3}{4}$$

$$(x - \frac{1}{2})^2 = y - \frac{3}{4} \Rightarrow x - \frac{1}{2} = \sqrt{y - \frac{3}{4}} + \frac{1}{2} \Rightarrow R_f = [\frac{3}{4} + \infty)$$

$$\text{ه) } y = \frac{x^2 + 1}{x^2 - 1} \Rightarrow x^2 + 1 = y(x^2 - 1) \Rightarrow x^2 - yx^2 = -1 - y \Rightarrow x^2(1-y) = -1-y \Rightarrow x^2 = \frac{-1-y}{1-y}$$

$$\Rightarrow x = \pm \sqrt{\frac{-1-y}{1-y}} \quad R_f = [-1 + \infty) \quad -\text{ع}$$

$$\text{و) } \frac{|x|+1}{|x|-1} = y \Rightarrow |x|+1 = y(|x|-1) \Rightarrow |x|+1 = y|x|-y \Rightarrow |x|(1-y) = -1-y \Rightarrow |x| = \frac{-1-y}{1-y}$$

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

$$y = \frac{1}{x^2 - 2x} \Rightarrow 1 = y(x^2 - 2x) \Rightarrow x^2 - 2xy - 1 = 0$$

$$\Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{2y \pm \sqrt{4y^2 + 4}}{2} = y \pm \sqrt{y^2 + 1} \Rightarrow y^2 + 1 \geq 0 \Rightarrow y \in \mathbb{R}$$

$$\Rightarrow R_f = [-1 + \infty)$$

$$\text{ز) } y = x^2 - 2x + 1 \quad \min \left| \frac{y}{x} \right| = -1 \quad R_f = [-1, +\infty)$$

$$\text{ح) } y = -x^2 + 2x + 1 \quad \max \left| \frac{y}{x} \right| = 1 \quad R_f = (-\infty, +1]$$

فرمانی سے ملے ہوئے

ا) $y = \sqrt{x^2 - 4x + 5}$ $\min \left| \frac{-x}{-2} \right| = \frac{1}{2}$ $R_f = \sqrt{[-2, +\infty)}$ $\rightarrow R_f = [0, +\infty)$ - 1

ب) $y = \sqrt{-x^2 + 4x + 5}$ $\max \left| \frac{-x}{-2} \right| = \frac{1}{2}$ $R_f = \sqrt{(-\infty, 1]} \Rightarrow R_f = [0, \sqrt{1}]$

ج) $y = x^2 + 2x + 1 \Rightarrow R_f = \mathbb{R}$ - 1

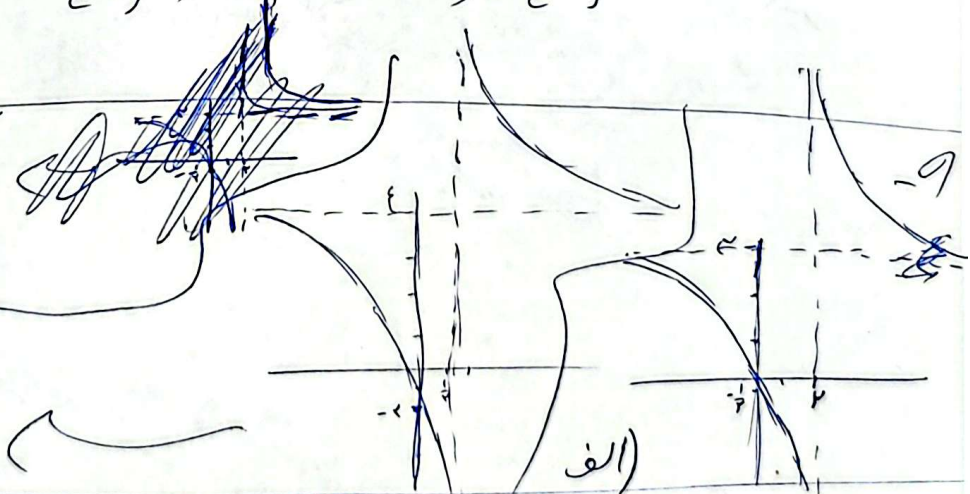
د) $y = \sqrt{x^2 + 4x + 5} \Rightarrow R_f = \sqrt{\mathbb{R}} \Rightarrow R_f = [0, +\infty)$

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

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

ز) $y = \frac{x+1}{x-2}$ $a=2$ $b=1$

ح) $y = \frac{x-2}{1-x}$ $a=\frac{1}{2}$ $b=2$



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

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