

$$\sqrt{x+\sqrt{x-1}} + \sqrt{x-1}\sqrt{x-1} = t$$

$$t^2 = x + \sqrt{x-1} + x - 1\sqrt{x-1} + 2\sqrt{x^2 - 13x + 9}$$

$$t^2 = 2x + 2\sqrt{x-1}$$

$$t = \sqrt{2x-1} \Rightarrow 2\sqrt{x-1}$$

$$\begin{aligned} a &= 0 \\ c &= -1 \\ h &= 2 \end{aligned} \Rightarrow \left(-\frac{1}{2}\right)$$

$$f(x) = \frac{x+2}{x^2-4x+9}$$

$$f(2) = -\frac{1}{2}$$

$$f(1) = 0$$

$$f(3) = 0$$

$$f(0) = \frac{2}{9}$$

$$\Rightarrow \frac{9}{f} = (2, -\frac{1}{2}) \text{ و } (1, 0) \text{ و } (3, 0) \text{ و } (0, \frac{2}{9})$$

$$الف) f(2x) = (\frac{1}{2}, 2) \text{ و } (\frac{2}{3}, -1) \text{ و } (2, 2) \text{ و } (-\frac{1}{2}, 6)$$

$$ب) f(x^2) = (\pm 1, -1) \text{ و } (\pm \sqrt{2}, 2)$$

$$ج) 2 \text{ و } f(x) + 1 = (-2, \frac{1}{9}) \text{ و } (1, \frac{2}{9}) \text{ و } (3, \frac{2}{9}) \text{ و } (-1, 1)$$

$$د) (3, -1) \text{ و } (1, -4) \text{ و } (-1, 0)$$

$$h = 2f + 9$$

$$(2, \infty) \text{ و } (-\infty, 6) \text{ و } (2, 5)$$

$$Df = \begin{cases} \sqrt{cx} - x \geq 0 \Rightarrow x^2 - cx \leq 0 \\ Df = \mathbb{R} - \{x\} \end{cases}$$

$$\frac{0}{+f} = \frac{0}{-f} + \frac{0}{+f} = 0$$

$$D \left(\frac{f}{g+1} \right) x \Rightarrow Df = [0, c] = \{x\} \Rightarrow n = \{0, 1, 2\}$$

$$g = [x] + [-x] \Rightarrow g \neq -1 \Rightarrow x \in \mathbb{Z}$$

$$f(1) = 0$$

$$f(2) = 2$$

$$f(3) = 0$$

$$f(4) = 0$$

$$\Rightarrow h(x) = \frac{f(x)}{g(x)} = (1,0), (2,1), (3,0), (4,0)$$

$$الف) y = (x-1)^2 + 1 \Rightarrow \sqrt[3]{y-1} - 1 = x \Rightarrow R_f = \mathbb{R}$$

$$ب) y = \frac{1}{x^2 - 2x} \Rightarrow yx^2 - 2yx - 1 = 0 \Rightarrow \Delta \geq 0 \Rightarrow 4y \pm \sqrt{4y^2 + 4y} \neq 0$$

$$\begin{array}{c} 4y^2 + 4y > 0 \\ 4y(y+1) > 0 \end{array} \quad \begin{array}{c} -1 \quad 0 \\ + \quad - \quad + \\ 2 \quad 2 \quad 2 \end{array}$$

$$الف) y = x^2 - 4x + 10 \Rightarrow R_f = [9, +\infty)$$

$$x_5 = 2 \quad y_5 = 9$$

$$ب) y = -x^2 + 6x + 9 \Rightarrow R_f = (-\infty, 17]$$

$$x_5 = 3 \quad y_5 = 17$$

$$ج) y = \sqrt{x^2 - 2x - 2} \Rightarrow R_f = [0, +\infty)$$

$$د) y = \sqrt{5x - x^2} \Rightarrow [0, 9]$$

$$الف) \mathbb{R}$$

$$ب) \mathbb{R}$$

$$ج) [0, +\infty)$$

$$د) [0, \infty)$$

$$\mathbb{R} - \left\{ \frac{9}{2} \right\}$$

$$الف) \mathbb{R} - \{3\}$$

$$ب) \mathbb{R} - \{7\}$$