



$$f(x) = \sqrt{-(x-1)(x-4)} \Rightarrow D_f = [1, 4]$$

$$\Rightarrow h(x) = \left\{ (1, 0), \left( \frac{5}{2}, \frac{\sqrt{3}}{2} \right), (4, 0) \right\} \quad \text{ج}$$

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

$$x = \sqrt[3]{y-1} + 1 \Rightarrow R_f = \mathbb{R} \quad \text{ج}$$

$$\text{ب) } x' - 2x = \frac{1}{y} \Rightarrow x' - 2x + 1 = \frac{y+1}{y} \Rightarrow (x-1)' = \frac{y+1}{y}$$

$$\Rightarrow x-1 = \pm \sqrt{\frac{y+1}{y}} \Rightarrow x = \pm \sqrt{\frac{y+1}{y}} + 1 \Rightarrow \frac{y+1}{y} \geq 0 \Rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$

$$\text{الف) } x_5 = \frac{5}{2} = 2 \Rightarrow y_5 = 5 \Rightarrow R_f = [5, +\infty)$$

$$\text{ب) } x_5 = \frac{5}{-2} = -2 \Rightarrow y_5 = 1 \Rightarrow R_f = (-\infty, 1]$$

$$\text{ج) } x_5 = \frac{5}{2} = 2 \Rightarrow y_5 = -1 \Rightarrow R_f = [0, +\infty) \quad \text{ج}$$

$$\text{د) } x_5 = \frac{5}{-2} = -2 \Rightarrow y_5 = 9 \Rightarrow R_f = [0, 9]$$

$$\text{الف) } R_f = \mathbb{R}$$

$$\text{ب) } R_f = \mathbb{R} \quad \text{ج}$$

$$\text{ج) } R_f = [0, +\infty)$$

$$\text{د) } R_f = [0, +\infty)$$

$$\text{الف) } R_f = \mathbb{R} - \{2\} \quad \text{ج}$$

$$\text{ب) } R_f = \mathbb{R} - \{2\}$$