

$$f(x) = \sqrt{(x-4)+2} \text{ و } g(x) = \sqrt{(x-4)-2} \xrightarrow{x \geq 1} f(x)+g(x) = 2\sqrt{x-4}$$

$$\rightarrow a=0, c=-4, b=2 \rightarrow a+b+c = -2$$

$$\frac{g}{f} = f\left(1, \frac{1}{4}\right) \text{ و } \left(0, \frac{4}{3}\right)$$

$$\text{الف) } f(x) = \left\{ \left(\frac{1}{2}, \frac{1}{4}\right), \left(\frac{3}{2}, 1\right), (2, 2), \left(\frac{5}{2}, \frac{9}{4}\right) \right\}$$

$$\text{ب) } f(x) = \left\{ (1, 2), (-1, 2), (\sqrt{4}, 1), (-\sqrt{4}, 1), (2, 2), (-2, 2) \right\}$$

$$\text{ج) } 2g(x)+1 = \left\{ (-2, 1), (\sqrt{4}, 1), (\sqrt{4}, 9), (-1, 1) \right\}$$

$$\Rightarrow \frac{f}{g} = \left\{ (1, -4), (2, -1) \right\}$$

$$h = 2f + g = \left\{ (2, 0), (-2, 4), (\sqrt{4}, 0) \right\}$$

$$f \text{ محدب: } x \geq 0 \rightarrow x \geq 0 \quad \sqrt{x-x} \geq 0 \rightarrow x-x \geq 0 \rightarrow 0 \leq x \leq x \Rightarrow D_f = [0, x] - \{x\}$$

$$g \text{ محدب: } \rightarrow x \in \mathbb{Z} \rightarrow g_{n+1} = 1 \Rightarrow x \in \mathbb{Z} \rightarrow \{0, 1, 2\}$$

$$\rightarrow x \notin \mathbb{Z} \rightarrow g_{n+1} = 0 \rightarrow \text{صفر}$$

$$f(x) = \frac{1}{1+x} \rightarrow D_f = [1, 4] \rightarrow h(x) = \left\{ (1, 0), (4, 0), \left(2, \frac{\sqrt{4}}{2}\right) \right\}$$

$$\text{الف) } y = (x-1)^2 + 1 \rightarrow \sqrt{y-1} + 1 = x \rightarrow R_f = \mathbb{R}$$

$$\text{ب) } y^2 - 4y - 1 = 0 \rightarrow x = \frac{4y \pm \sqrt{16y^2 + 4y}}{2y} \rightarrow 1 \pm \frac{\sqrt{4y^2 + y}}{y} \rightarrow y^2 + y \geq 0$$

$$\frac{-1 \pm 0}{+1 - 1 \pm 1} \rightarrow R_f = (-\infty, -1] \cup [0, \infty)$$

$$\text{الف) } \left| \frac{1}{x} \right| \rightarrow [0, \infty) \text{ ب) } \left| \frac{1}{x} \right| \rightarrow (-\infty, 0] \text{ ج) } \left| \frac{1}{x} \right| \rightarrow \sqrt{[1, \infty)} \rightarrow [0, \infty)$$

$$\Rightarrow \left| \frac{1}{x} \right| \rightarrow [0, \infty)$$

$$[0, \infty) \in \text{مستقيم} > \text{نكون المستقيم} \leftarrow \text{ج) المستقيم} \leftarrow R \text{ ب) } R \text{ الف) } R$$

الف) $P - \{x\}$ ب) $Q - \{x\}$

110