

$$f(x) = \sqrt{x+2}\sqrt{x-4} \quad x \geq 4 \rightarrow f(x) + g(x) = a + b\sqrt{x+c}$$

$$g(x) = \sqrt{x-4}\sqrt{x-4}$$

$$\frac{a+b}{c} = 1 \quad \sqrt{(x-4+2)^2} + \sqrt{(x-4-2)^2} = \sqrt{x-4+2} + 1$$

$$x+2\sqrt{x-4} = (\sqrt{x-4}+2)^2 = (\sqrt{x-4})^2 + 4 + 4\sqrt{x-4} + 1\sqrt{x-4-2}$$

$$\frac{0+2}{-4} = \boxed{-\frac{1}{2}}$$

$$= \sqrt{x-4} + 2 + \sqrt{x-4} - 1$$

$$= 2\sqrt{x-4} = a + b\sqrt{x+c}$$

$$\Rightarrow a=0 \quad b=2, \quad c=-4$$

$$f(x) = \frac{x+2}{x^2-4x+4} \quad g(x) = \{(2,1), (1,0), (3,0), (0,2)\} \rightarrow Dg = \{2, 1, 3, 0\}$$

$$\frac{g}{f} = 1 \quad Df = \mathbb{R} - \{1, 2\} \quad Dg \cap Df = \{2, 0\}$$

$$\frac{g(2)}{f(2)} = \frac{1}{-4} = -\frac{1}{4} \quad \frac{g(0)}{f(0)} = \frac{2}{\frac{2}{16}} = 2 \times \frac{16}{2} = 8$$

$$\frac{g}{f}(x) = \{(0, 8), (2, -\frac{1}{4})\}$$

$$f(x) = \{(1,2), (2,1), (4,2), (-1,4)\} \quad g(x) = \{(-2,3), (1,-1), (3,2), (-1,0)\}$$

$$a) f(2x) = \{(1,2), (1,2), (2,1), (-1,4)\}$$

$$b) f(x^2) = \{(1,2), (1,2), (\sqrt{4},-1), (-\sqrt{4},-1), (2,2), (-2,2)\}$$

$$c) 2g^2(x) + 1 = \{(-2,9), (1,9), (3,9), (-1,1)\}$$

$$d) \frac{2f}{g} = \{(1,-4), (3,-1)\}$$

$$f(x) = \{(2,1), (3,1), (4,9), (-2,0)\} \quad 2f = \{(2,2), (3,2), (4,18), (-2,0)\}$$

$$g = \{(5,1), (2,3), (-2,4), (-1,2), (3,3)\}$$

$$h = 2f + g = \{(2,5), (3,5), (-2,4)\}$$

$$[x] + [-x] = 0 \quad x \in \mathbb{Z} \quad f(x) = \frac{\sqrt{3x-x}}{x-2} \quad Df = [0,3] - \{2\}$$

$$[x] + [-x] = -1 \quad x \notin \mathbb{Z}$$

$$g(x) = [x] + [-x] \quad g=0 \rightarrow \frac{f}{1} \checkmark$$

$$g = -1 \quad \text{تن } x$$

$$Dg \cap Df = \{0, 1, 3\}$$

$$x \geq 2 \quad x \neq 2$$

$$\sqrt{3x-x} \geq 2$$

$$\sqrt{3x-x} \geq x^2 \rightarrow [0,3]$$

$$3x \geq x^2 \quad x^2 - 3x \leq 0$$

$$x(x-3) \leq 0$$

$$f(x) = \sqrt{4x - x^2 - 4} \quad g(x) = \{(1,3) (2,2) (3,4) (4,1)\}$$

$$h(x) = \frac{f(x)}{g(x)} = 1 \quad -x^2 + 4x - 4 \geq 0$$

$$h(x) = \{(1,0) (2,0) (3,0) (4,0)\}$$

$$f(1) = 0$$

$$f(2) = 2$$

$$f(4) = 0$$

$$\begin{aligned} x^2 - 4x + 4 &\leq 0 \\ (x-2)(x-2) &\leq 0 \\ \frac{x-2}{1} &\leq 0 \end{aligned}$$

$$[2,2]$$

$$\text{الف) } y = x^3 - 3x^2 + 3x \quad \mathbb{R}$$

$$\text{ب) } y = \frac{1}{x^2 - 2x}$$

$$yx^2 - 2yx = 1$$

$$yx^2 - 2yx - 1 = 0$$

$$x = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y}$$

$$4y^2 + 4y \geq 0$$

$$4y(y+1) \geq 0$$

$$\Delta I \cap \Delta II = (-\infty, -1] \cup (0, +\infty)$$

$$\begin{aligned} \frac{-1 \pm \sqrt{1-4}}{2} &= \frac{-1 \pm \sqrt{-3}}{2} \\ \text{I: } (-\infty, -1] \cup [0, +\infty) \\ \text{II: } 2y \neq 0 \quad y \neq 0 \end{aligned}$$

$$\text{الف) } y = x^2 - 4x + 10 \quad \frac{f}{y} = 2 \quad [4, +\infty)$$

$$\text{ب) } y = -x^2 + 4x + 3 \quad \frac{-y}{-2} = 2 \quad (-\infty, 12]$$

$$\text{ج) } y = \sqrt{x^2 - 4x - 3} \quad \frac{f}{y} = 2 \quad \sqrt{[4, +\infty)} = [0, +\infty)$$

$$\text{د) } \sqrt{4x - x^2} \quad \frac{-y}{-2} = 2 \quad \sqrt{[-\infty, 4]} = [0, 2]$$

$$\text{الف) } \mathbb{R}$$

$$\text{ب) } \mathbb{R}$$

$$\text{ج) } \sqrt{\mathbb{R}} = [0, +\infty)$$

$$\text{د) } \mathbb{R}^2 = [0, +\infty)$$

$$\text{الف) } y = \frac{3x+1}{x-2} \quad \mathbb{R} - \left\{\frac{a}{c}\right\} \quad \mathbb{R} - \{2\}$$

$$\text{ب) } y = \frac{2x+1}{x+1} \quad \mathbb{R} - \{2\}$$