

لا بد من أن يكون

$$A \times B = \{(1,2), (1,3), (2,2), (2,3), (3,2), (3,3)\} \Rightarrow (A \times B) - B^c = \{(1,2), (1,3)\}$$

$$B \cap B = \{(2,2), (2,3), (3,2), (3,3)\}$$

-1

$$m^2 \geq m+2 \Rightarrow m^2 - m - 2 \geq 0 \Rightarrow (m-2)(m+1) \geq 0 \Rightarrow \boxed{m \geq 2, -1}$$

(الف، ٢)

$$\text{if } m=2 \Rightarrow f(2) = \{(2,1), (2,4)\} \rightarrow \text{تابع زوج} \Rightarrow \boxed{m \geq -1}$$

$$m^2 \geq m+2 \Rightarrow m^2 - m - 2 \geq 0 \Rightarrow \boxed{m \geq 2, -1} \quad \text{if } m=-1 \Rightarrow g(1) = \{(-1,4), (-1,2)\} \rightarrow \text{تابع زوج}$$

$$a=1 \Rightarrow a^2-1 \geq a^2+b \Rightarrow \boxed{0 \geq a+b} \quad a \geq 2 \Rightarrow a^2 \geq a^2+b \Rightarrow \boxed{0 \geq a+b}$$

$$\begin{cases} a^2+b \geq 1 \\ a+b \geq 0 \end{cases} \Rightarrow \boxed{a \geq 1, b \geq -1} \Rightarrow \boxed{a \times b \geq -1}$$

٥٢

$$\text{if } a \in K \Rightarrow a^2-2 \in \mathbb{R} \Rightarrow a^2-2 \geq 0 \Rightarrow a^2 \geq 2 \Rightarrow a \geq \sqrt{2} \Rightarrow \boxed{K \geq \sqrt{2}}$$

$$D_f = \mathbb{R} - \{0\} \quad R_f = \{a > 1\} \Rightarrow R_f = \underline{(-\infty, 1)}$$

$$\text{if } -1 \leq a < 1 \Rightarrow R_f = \underline{(-1, 1]} \quad \text{if } a < -1 \Rightarrow R_f = \underline{(-\infty, -1)}$$

$$\Rightarrow R_{f_T} = R_f \cup R_{f_1} \cup R_{f_2} = \underline{(-\infty, 1]}$$

$$xy^2 + x^2 < 1 \geq 0 \Rightarrow xy_1^2 \geq xy_2^2 \Rightarrow \boxed{y_1 \geq y_2} \quad \text{تابع زوج}$$

(الف، ٩)

$$2^x - 4y^2 - 2x - 12y + 1 \geq 0 \quad (2^x - 2x + 1) + (4y^2 - 12y + 9) \geq 0$$

$$(2-1)^x + (2y-3)^2 \geq 0 \Rightarrow \boxed{x=1, y=3/2} \quad \text{نقطة تابعة}$$

(ب)

$$a \sin y = y \sin x \rightarrow \text{if } a=0 \Rightarrow 0 \times (\sin y) = y \times 0 \Rightarrow y=0 \quad \text{--- غير صحيح (الف) ١٧}$$

$$\sqrt{\frac{a}{y}} + \sqrt{\frac{y}{a}} = 2 \Rightarrow \frac{a}{y} + \frac{y}{a} = 4 \Rightarrow \frac{a^2 + y^2}{ay} = 4 \Rightarrow a^2 + y^2 = 4ay$$

$$\Rightarrow a^2 + y^2 - 4ay = 0 \rightarrow \text{if } a=1 \Rightarrow y^2 - 4y + 1 = 0 \Rightarrow \Delta = 16 - 4 = 12 \Rightarrow y = \frac{4 \pm \sqrt{12}}{2}$$

تابع عكسي

$$\left. \begin{array}{l} \sqrt{\frac{a-1}{a-2}} \quad \frac{1}{+} \quad \frac{2}{-} \quad \frac{4}{+} \Rightarrow D_f = (-\infty, 1] \cup (2, +\infty) \\ \sqrt{\frac{2-a}{a}} \quad \frac{0}{-} \quad \frac{2}{+} \quad \frac{4}{-} \Rightarrow D_f = (0, 2] \end{array} \right\} D_{fT} = [0, 1]$$

(الف) ١٨

$$\sqrt{a} \geq 0, \sqrt{2} + \sqrt{y-1} = \sqrt{a} \Rightarrow a \leq 2 \Rightarrow D_f = [0, 2]$$

(ب)

$$g = \frac{\sqrt{a^2 - 4a + 4}}{\sqrt{a - 10a + 14}} \Rightarrow \sqrt{a^2 - 4a + 4} = \sqrt{(a-1)(a-4)} \quad \frac{1}{+} \quad \frac{4}{-} \quad \frac{4}{+} \Rightarrow D_f = (-\infty, 1] \cup [4, +\infty)$$

(الف) ١٩

$$\sqrt{-9a + 14} \Rightarrow a \leq \frac{14}{9} \quad \frac{14}{+} \quad \frac{9}{-} \Rightarrow D_f = (-\infty, \frac{14}{9}]$$

$$\Rightarrow D_{fT} = (-\infty, 1]$$

$$g = \frac{\sqrt{a^2 - 4a + 4}}{\sqrt{a^2 - 10a + 14}} = \frac{\sqrt{(a-1)(a-4)}}{\sqrt{(a-1)(a-11)}} \quad \frac{1}{+} \quad \frac{4}{-} \quad \frac{4}{+} \quad \frac{11}{-}$$

(ب)

$$D_f = (-\infty, 1] \cup (4, 11] \cup (11, +\infty)$$

$$\sqrt{4a^2 - 8a + 4} \Rightarrow \Delta = 4a - 4 \in \mathbb{Z} \Rightarrow a = \frac{4 \pm 1}{2} = \frac{5}{2}, 1$$

(الف) ٢٠

$$D_f = (-\infty, 1] \cup [\frac{5}{2}, +\infty)$$

$$\frac{1}{+} \quad \frac{5}{-} \quad \frac{4}{+}$$

$$\sqrt{4a^2 - 4a + 4} \Rightarrow \Delta = 4 - 4a \in \mathbb{Z} \Rightarrow a = \frac{4 \pm 1}{4} = 1, \frac{3}{4}$$

$$D_f = (-\infty, 1] \cup (\frac{3}{4}, +\infty)$$

$$\Rightarrow D_{fT} = (-\infty, 1] \cup [\frac{3}{4}, +\infty)$$

$$g = \sqrt{\frac{2n^2 - 8n + 3}{2n^2 - 7n + 5}} = \sqrt{\frac{(2n-3)(n-1)}{(n-1)(2n-5)}}$$

$$\begin{array}{c} * \\ 1 \quad \frac{5}{2} \quad \frac{3}{2} \\ + \quad - \quad + \quad - \quad + \end{array}$$

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$$\Rightarrow \text{Def } (-\infty, \frac{5}{2}) \cup [\frac{3}{2}, +\infty) - \{1\}$$

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