

الف) $x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x + 4 = 0 \rightarrow (x-1)(x-4) = 0 \rightarrow x = 1, 4$

ب) $x^2 - 4x - 3 = 0 \rightarrow x^2 - 4x + 4 = 0 \rightarrow (x-2)^2 = 0 \rightarrow x = 2$

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$A \times B = \{ (1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,2), (3,3) \}$

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

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

الف) $(x, m^2) (x, m^2) \rightarrow m^2 = m^2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow m = 2, -1$

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الف) $m = -1$

ب) $(1, a^2) (1, a^2) \rightarrow a^2 = a^2 \rightarrow a^2 - 3a + 2 = 0 \rightarrow (a-1)(a-2) = 0 \rightarrow a = 1, 2$

$$a=1 \Rightarrow f(a)= \begin{cases} a^2-1=0 \\ a+b=0 \end{cases} \Rightarrow a+b=0 \quad (1)$$

$$a=2 \Rightarrow f(a)= \begin{cases} a^2-1=1 \\ a+b=1 \end{cases} \quad (2)$$

$$(1), (2) \Rightarrow a=1 \quad b=-1 \quad (ab = -1)$$

6

$$a=k \Rightarrow f(a)= \begin{cases} k^2-k \\ k-k \end{cases} \Rightarrow k-k=0 \Rightarrow k=k \Rightarrow k=\frac{V}{\omega} = 1/4$$

7

$$y^3-4y = a^2-4a+3 \Rightarrow y^3-4y=0 \Rightarrow y(y^2-4)=0 \Rightarrow y=0 \text{ یا } y=\pm 2$$

$$b) |a|+|y|=3 \xrightarrow{a=0} |y|=3 \Rightarrow y=\pm 3$$

$$c) |y|=\sqrt{1-\cos a} \xrightarrow{a=\pi} |y|=\sqrt{1-(-1)}=1 \Rightarrow y=\pm 1$$

$$d) y^2+a^2+2a+1=0 \Rightarrow y^2+(a+1)^2=0 \Rightarrow y=0, a=-1$$

$$\begin{cases} (a_1, y_1) \in F \\ (a_2, y_2) \in F \end{cases} \Rightarrow \begin{cases} a_1^2+y_1^2=2 \\ a_2^2+y_2^2=2 \end{cases} \Rightarrow a_1^2+y_1^2=a_2^2+y_2^2 \Rightarrow a_1^2-a_2^2=y_2^2-y_1^2 \Rightarrow (a_1-a_2)(a_1+a_2)=(y_2-y_1)(y_2+y_1)$$

$$b) y^3+xy=a \quad (a_1, y_1) \in F \quad (a_2, y_2) \in F \Rightarrow \begin{cases} y_1^3+y_1 a_1=a_1 \\ y_2^3+y_2 a_2=a_2 \end{cases} \Rightarrow y_1^3+y_1 a_1=y_2^3+y_2 a_2 \Rightarrow y_1^3-y_2^3+y_1 a_1-y_2 a_2=0$$

$$c) \sin y = y \sin a \xrightarrow{a=0} y \times \sin 0 = 0 \Rightarrow y \times 0 = 0 \Rightarrow y \in \mathbb{R}$$

$$b) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \quad A^2 = \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{xy}} = 4 \Rightarrow \frac{x}{y} + \frac{y}{x} = 2$$

$$\Rightarrow \frac{x^2+y^2}{xy} = 2 \Rightarrow x^2+y^2=2xy \Rightarrow x^2-2xy+y^2=0 \Rightarrow (x-y)^2=0 \Rightarrow x=y$$

10