

الف) $x^2 - 4x + 4 = 0 \rightarrow (x-2)^2 = 0 \rightarrow x = 2$ $\frac{-4 \pm \sqrt{16}}{2} = \frac{-4 \pm 4}{2}$
 $\frac{-4}{2} = -2$
 $\frac{4}{2} = 2$

ب) $x^2 - 4x - 5 = 0 \rightarrow (x-5)(x+1) = 0 \rightarrow x = 5, -1$ $\frac{4 \pm \sqrt{16+20}}{2} = \frac{4 \pm 8}{2}$
 $\frac{4}{2} = 2$
 $\frac{-1}{2} = -\frac{1}{2}$

ج) $x^2 - 4x - 12 = 0 \rightarrow (x-6)(x+2) = 0 \rightarrow x = 6, -2$ $\frac{4 \pm \sqrt{16+48}}{2} = \frac{4 \pm 8}{2}$
 $\frac{4}{2} = 2$
 $\frac{-2}{2} = -1$

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$A \times B = \{[1, 2], [1, 3], [2, 2], [2, 3], [3, 2], [3, 3]\}$

$B^2 = \{[2, 2], [2, 3], [3, 2], [3, 3]\}$

$A \times B - B^2 = \{[1, 2], [1, 3]\}$

مجموعه است از؟ استفاده کن!

الف) $(2, 1), (2, 4) \rightarrow (2, 1), (2, 4)$ $m = -1$

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الف) $m = -1$

ب) $(1, 2), (1, 3) \rightarrow (1, 2), (1, 3)$ $a = 2$

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

$$a=2 \Rightarrow f(a)= \begin{cases} a^2-1=3 \\ a+b=1 \end{cases} \quad (2)$$

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

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$$a=k \Rightarrow f(a)= \begin{cases} k^2-3 \\ 4-3k \end{cases} \Rightarrow k^2-3 = 4-3k \Rightarrow k^2+3k-7=0 \Rightarrow k = \frac{-3 \pm \sqrt{9+28}}{2} = \frac{-3 \pm \sqrt{37}}{2}$$

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

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

$$ج) |y| = \sqrt{1-\cos a} \xrightarrow{a=\frac{\pi}{2}} |y| = 1 \Rightarrow y = \pm 1$$

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

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

$$ب) y^3+xy = a^2 \Rightarrow (a_1, y_1) \in F, (a_2, y_2) \in F \Rightarrow y_1^3+y_1 a_1 = a_1^2, y_2^3+y_2 a_2 = a_2^2 \Rightarrow y_1=y_2$$

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

$$ب) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow A^2 = \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{xy}} = 4 \Rightarrow \frac{x}{y} + \frac{y}{x} = 2 \Rightarrow \frac{x^2+y^2}{xy} = 2 \Rightarrow x^2+y^2=2xy \Rightarrow (x-y)^2=0 \Rightarrow x=y$$

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(۱۰-ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$

این عبارت تنها زمانی برقرار است که $1 = \sqrt{\frac{x}{y}}$ باشد پس

$\sqrt{\frac{x}{y}} = 1 \leadsto \frac{x}{y} = 1 \leadsto x = y$ و $(x, y \neq 0)$

