

19/25

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سؤال 1) $x^2 - 5x - 14 = 0 \rightarrow (x-7)(x+2) \rightarrow x=7, -2$ $x^2 - 2x - 12 = 0 \rightarrow (x-6)(x+2) \rightarrow x=6, -2$

سؤال 2) $x^2 - 8x - 9 = 0 \rightarrow (x-9)(x+1) \rightarrow x=9, -1$ $x^2 - 5x - 14 = 0 \rightarrow (x-7)(x+2) \rightarrow x=7, -2$

سؤال 3) $(m-7)(m+2) \rightarrow m=7, -2$ $x^2 + 5x + 4 \rightarrow (x+1)(x+4) \rightarrow x=-1, -4$

سؤال 4) $4 - 14 > 0 \rightarrow \Delta > 0$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{-3 \pm \sqrt{9 + 14}}{4} \rightarrow \frac{-3 \pm \sqrt{23}}{4}$

سؤال 5) $A = \{1, 2, 3\}$ $B = \{2, 3\}$
 $A \times B = \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\}$
 $B^c = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$
 $A \times B - B^c = \{(1, 2), (1, 3)\}$

سؤال 6) $m^2 = m + 2 \rightarrow 0 = m^2 - m - 2 \Rightarrow (m-2)(m+1) = 0$ $m = -1$ $m = 2$
 $m = 2$ تحقق $\rightarrow (2, 4), (2, 1)$
 $m = -1$ تحقق $\rightarrow (-1, 4), (-1, 3)$

سؤال 7) $a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \rightarrow (a-1)(a-2) = 0$ $a = 1$ $a = 2$
 $a = 1$ تحقق $\rightarrow (1, 1), (1, 2), (1, 3), (1, 4)$
 $a = 2$ تحقق $\rightarrow (2, 4), (2, 1)$

سؤال 8) $x \Rightarrow 1 \Rightarrow x = a + b$ $a = 7$ $a \times b \Rightarrow -47$
 $x \Rightarrow 2 \Rightarrow 1 = 2a + b$ $b = -4$

سؤال 9) $x = K$ $2K - 3 = 4 - 2K \rightarrow 4K = 7 \Rightarrow K = \frac{7}{4}$

سؤال 10) $y_1^2 - 4y_1 = y_2^2 - 4y_2$
 $y_1^3 - y_2^3 = 4y_1 + 4y_2 = 0 \rightarrow y_1^3 - y_2^3 - 4(y_1 + y_2) = 0$
 $(y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 - 4) = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 - 4) = 0$
 $\frac{-y_2 \pm \sqrt{y_2^2 - 4(y_2 - 4)}}{2}$

۱) $|y| = 3 - |x| \rightarrow \text{if } x = 0 \rightarrow y = \pm 3 \quad \times$

۲) $\text{if } \cos x = 0 \rightarrow |y| = 1 \rightarrow y = \pm 1 \quad \times$

۳) $y^2 + (x+1)^2 \geq 0 \rightarrow (-1, 0) \quad \checkmark \rightarrow \text{نقطه}$

الف) $\sqrt[3]{y_1} = -x^2 + 2x - 2$
 $\sqrt[3]{y_2} = -x^2 + 2x - 2 \Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2 \quad \checkmark$

(۹ سوال)

ب) $\begin{cases} y_1^3 + 2y_1 = 0 \\ y_2^3 + 2y_2 = 0 \end{cases} \Rightarrow y_1^3 + 2y_1 = y_2^3 + 2y_2 \rightarrow (y_1^3 - y_2^3) + 2(y_1 - y_2) = 0$

$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 2) = 0$

$\Delta = \sqrt{y_1^2 - 4y_2^2 - 4} \Rightarrow \text{زیرادکی منفی} \Rightarrow \Delta \neq 0 \Rightarrow y_1 = y_2 \quad \checkmark$
 فقط مساوی
 صفر و منفی

الف) $x \sin y = y \sin x \xrightarrow{x=\pi} \pi \sin y = y \sin \pi \rightarrow \sin y = 0 \rightarrow y = k\pi \rightarrow \pi, 2\pi, \dots \quad \times$

ب) $\frac{x}{y} + \frac{y}{x} + 2 = 4 \rightarrow x^2 + y^2 - 2xy \rightarrow (x-y)^2 = 0 \Rightarrow x = y \quad \checkmark$
 (x و y ناهمبسته!)

۴) $x=1, x=2$ در هر دو ضربه مشترک هستند پس باید ضربه ها به ازای آنها صحیح عمل کنند.

$(1)^2 - 1 = a(1) + b \Rightarrow a + b = 0 \Rightarrow b = -a$

$2(a) + b = 2^2 \xrightarrow{b=-a} 2a - a = 4 \Rightarrow a = 4 \Rightarrow b = -4$

$a \times b = 4(-4) = -16$

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

این عبارت تنها زمانی به قدر ۲ می باشد که $\sqrt{\frac{x}{y}} = 1$

$\sqrt{\frac{x}{y}} = 1 \Rightarrow \frac{x}{y} = 1 \Rightarrow x = y \quad (x, y \neq 0)$

