

(الف) $x^2 - 5x - 36 = (x+4)(x-9) \Rightarrow x < \frac{1}{4} = \frac{1}{4}$ (1) آردن سفتی اوردن یا زخم سبب

ب) $x^2 - 8x - 9 = (x+1)(x-9) \Rightarrow x < \frac{1}{9} = \frac{1}{9}$

ج) $x^2 - 9x - 12 = (x+2)(x-9) \Rightarrow x < \frac{2}{9} = \frac{2}{9}$

د) $x^2 - 6x - 24 = (x+3)(x-8) \Rightarrow x < \frac{1}{3} = \frac{1}{3}$

ه) $x^2 - 5x - 14 = (x+2)(x-7) \Rightarrow x < \frac{1}{2} = \frac{1}{2}$

و) $2x^2 + 5x + 3 = (x+2)(x+3) \Rightarrow x < \frac{2}{3} = \frac{2}{3}$

ز) $x^2 + 2x + 3 = 4 - 12 < 0 \Rightarrow$ ندارد

ح) $2x^2 + 3x - 2 = \frac{-3 \pm \sqrt{9 + 24}}{4} = \frac{-3 \pm \sqrt{33}}{4}$

A = {1, 2, 3}, B = {1, 2}

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

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

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

(الف) $m+2 = m^2 \Rightarrow m < \frac{1}{2} = \frac{1}{2}$

ب) $m+2 = m^2 \Rightarrow m < \frac{1}{2} = \frac{1}{2}$

$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = (a-1)(a-2) \Rightarrow a = 1 \Rightarrow (1,1), (1,2) \times$

$a = 2 \Rightarrow (2,1), (2,2) \checkmark$

$x=1 \Rightarrow 1-1=0 = a+b \Rightarrow a=-b$

$x=2 \Rightarrow 2a-a=1 \Rightarrow a=1 \Rightarrow b=-1 \Rightarrow a \times b = 1 \times -1 = -1 \checkmark$

$2k-2 = 4-2k \Rightarrow 4k=6 \Rightarrow k = \frac{3}{2}$

(1)

$$\text{الف) } y(y^2 - 2) = (x-1)(x-3) \xrightarrow{x=1, x=3} y(y^2 - 2) = 0 \Rightarrow y < \frac{0}{\sqrt{4}} \Rightarrow \text{تابع نیست } \times$$

$$\text{ب) } |x| + |y| = 3 \xrightarrow{x=1} 1 + |y| = 3 \Rightarrow y < -2 \Rightarrow \text{تابع نیست } \times$$

$$\text{ج) } |y| = \sqrt{1 - \cos x} \xrightarrow{x=\frac{\pi}{2}} \cos x = \frac{1}{2} \Rightarrow |y| = \frac{\sqrt{2}}{2} \Rightarrow y < \frac{+\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} \Rightarrow \text{تابع نیست } \times$$

$$\text{د) } y' = -(x^2 + 2x + 1) \Rightarrow R_f = \emptyset \Rightarrow \text{تابع است } \checkmark$$

همواره منفی

(9)

$$\text{الف) } \begin{cases} y_1' = -(x_1^2 - 2x_1 + 2) \\ y_2' = -(x_2^2 - 2x_2 + 2) \end{cases} \Rightarrow x_1 = x_2 \Rightarrow \sqrt{y_1} - \sqrt{y_2} \Rightarrow y_1 = y_2 \Rightarrow \text{تابع است } \checkmark$$

$$\text{ب) } \begin{cases} y_1' + 2y_1 = 5x_1 \\ y_2' + 2y_2 = 5x_2 \end{cases} \xrightarrow{x_1=x_2} \begin{cases} y_1' + 2y_1 = y_2' + 2y_2 \\ y_1' - y_2' + 2(y_1 - y_2) = 0 \Rightarrow (y_1 - y_2)(y_1' + y_1 y_2' + y_2^2) + 2(y_1 - y_2) = 0 \\ \Rightarrow (y_1 - y_2)(y_1' + y_1 y_2' + y_2^2 + 2) = 0 \end{cases}$$

$$\frac{-y_2 \pm \sqrt{\Delta}}{2} \Rightarrow \Delta = y_2^2 - 4(y_2^2 + 2) \Rightarrow \Delta = -3y_2^2 - 8 < 0 \Rightarrow \text{صفر نمی شود} \Rightarrow y_1 = y_2 \checkmark \text{تابع است}$$

(10)

$$\text{الف) } x \sin y = y \sin x \Rightarrow \frac{x}{\sin x} = \frac{y}{\sin y} \xrightarrow{x=\frac{\pi}{2}} \frac{\pi}{2} = \frac{y}{\sin y} \Rightarrow y < \frac{\frac{\pi}{2}}{-\frac{\pi}{2}} \times \text{تابع نیست}$$

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

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