

19/5 آفرین

الف) $6x^2 - 5x - 6 = 0 \Rightarrow x^2 - 5x - 36 = 0 \Rightarrow (x-9)(x+4) = 0 \Rightarrow x = 9 \text{ یا } -4$

ب) $3x^2 - 8x - 3 = 0 \Rightarrow x^2 - 8x - 9 = 0 \Rightarrow (x-9)(x+1) = 0 \Rightarrow x = 9 \text{ یا } -1$

ج) $4x^2 - 4x - 3 = 0 \Rightarrow x^2 - 4x - 12 = 0 \Rightarrow (x-6)(x+2) = 0 \Rightarrow x = 6 \text{ یا } -2$

د) $2x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 24 = 0 \Rightarrow (x-8)(x+3) = 0 \Rightarrow x = 8 \text{ یا } -3$

ه) $x^2 - 5x - 14 = 0 \Rightarrow (x-7)(x+2) = 0 \Rightarrow x = 7 \text{ یا } -2$

و) $2x^2 + 5x + 3 = 0 \Rightarrow x^2 + 5x + 6 = 0 \Rightarrow (x+2)(x+3) = 0 \Rightarrow x = -2 \text{ یا } -3$

ز) $x^2 + 2x + 3 \Rightarrow \Delta = 4 - 12 = -8 \Rightarrow \Delta < 0 \Rightarrow$ ریشه ندارد

ح) $3x^2 + 4x - 7 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-4 \pm \sqrt{32}}{6} = \frac{-4 \pm 4\sqrt{2}}{6} = \frac{-2 \pm 2\sqrt{2}}{3}$

$A = \{1, 2, 3\}$

$B = \{2, 3\}$

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

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

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

الف) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m = 2 \text{ یا } -1$

ب) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m = 2 \text{ یا } -1$

$f(x) = \{(1, x^2), (1, 3x-2), (x^2, 3x+2)\}$

داده: $x^2 = 3x - 2 \Rightarrow x^2 - 3x + 2 = 0 \Rightarrow (x-1)(x-2) = 0 \Rightarrow x = 1 \text{ یا } 2$

$$f(x) = \begin{cases} x^r - 1 & x \leq 1 \\ ax + b & 1 \leq x \leq 2 \\ x^r & x > 2 \end{cases}$$

$$\text{If } x=1 \Rightarrow a+b=0$$

$$\text{If } x=2 \Rightarrow 2a+b=1$$

$$a=1, b=-1$$

$\Downarrow$

$$a \times b = -1 \neq f$$

$$f(x) = \begin{cases} rx - r & x > k \\ f - rx & x \leq k \end{cases}$$

$$\Rightarrow \text{If } x=k \Rightarrow rk - r = f - rk$$

$\Downarrow$

$$rk - r = f - rk$$

$$k = \frac{f+r}{2} = 1/f$$

$$\text{ا) } y^r - xy = x^r - f x + r \Rightarrow \text{If } x=1 \Rightarrow y^r - y = 0$$

$$(x-1)(x-r) = 0$$

$$y(y^r - y) = 0$$

$$\Rightarrow y = \pm \sqrt[r]{r} \quad \times$$

$$\text{ب) } |x| + |y| = r \Rightarrow \text{If } x=0 \Rightarrow |y| = r \Rightarrow y = \pm r \quad \times$$

$$\text{ج) } |y| = \sqrt{1 - \cos x} \Rightarrow \text{If } x=0 \Rightarrow |y| = \frac{\sqrt{r}}{r} \Rightarrow y = \pm \frac{\sqrt{r}}{r} \quad \times$$

$$\text{د) } y^r + (x+1)^r = 0 \Rightarrow x=-1, y=0 \Rightarrow \text{نقطة } \checkmark$$

$$\text{ا) } \sqrt[r]{y_1} = -x_1^r + rx_1 - r$$

$$\sqrt[r]{y_2} = -x_2^r + rx_2 - r$$

$$\Rightarrow \text{If } x_1 = x_2 \Rightarrow \sqrt[r]{y_1} = \sqrt[r]{y_2} \Rightarrow y_1 = y_2 \quad \checkmark$$

$$y_1 = y_2 \quad \checkmark$$

$$\text{ب) } y_1^r + ry_1 = \omega x_1$$

$$y_2^r + ry_2 = \omega x_2$$

$$\begin{aligned} y_1^r + ry_1 &= y_2^r + ry_2 \\ y_1^r - y_2^r + ry_1 - ry_2 &= 0 \\ (y_1 - y_2)(y_1^{r-1} + y_1^{r-2}y_2 + \dots + y_2^{r-1}) + r(y_1 - y_2) &= 0 \\ (y_1 - y_2)(y_1^{r-1} + y_1^{r-2}y_2 + \dots + y_2^{r-1} + r) &= 0 \end{aligned}$$

$$\Delta = y_1^{r-1} - ry_2^{r-1} - 1 < 0$$

$$\text{ا) } x \sin y = y \sin x \Rightarrow \text{If } x=1 \Rightarrow \sin y = 0$$

$$\Rightarrow y=0, 1 \quad \times$$

$$\text{ب) } \left(\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} \right)^r = (r)^r \Rightarrow \frac{x}{y} + \frac{y}{x} + r = r$$

!or (x,y ≠ 0)

$$\frac{x^r + y^r}{xy} = r \Rightarrow x^r + y^r = rxy$$

$$x^r + y^r - rxy = 0 \Rightarrow (x-y)^r$$

$$x=y \quad \checkmark$$

ج-۴) $(3, m^2)$ و $(3, m+2) \leadsto m^2 = m+2 \leadsto m^2 - m - 2 = 0$

$m=2 \rightarrow (2, 1)$ و $(2, 4) \times$

$m=-1 \rightarrow (-1, 4) (-1, 3) \times$ به ازای هیچ مقدار m عبارت تانژانت!

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

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

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

