Subject:
Year. Month. Date. ( )

دریا ربانی اردستی

(۱)

$y = -x^2 + bx + 3$

$y_s = 7 = \frac{-\Delta}{4a} \to \Delta = b^2 - 4ac = b^2 - 4(-1)(3) = b^2 + 12 \Rightarrow -\frac{(b^2+12)}{-4} = 7$

$-b^2 + 12 = -28 \to -b^2 = -16$

$b^2 = 16 \to b = \pm 4$

(۲)

الف) $f(x) = x^4 + 2x^2 + 3 \to \Delta \to 4 - 4\times 3 = -8$

$t^2 + 2t + 3$ $\quad -8 < 0 \to$ هیچ ریشه ندارد

ب) $f(x) = (4-x^2)^2 - 2(4-x^2) - 15 \to t^2 - 2t - 15 \to (t-5)(t+3) = 0$

$4 - x^2 = t$

$4 - x^2 - 5 = 0 \to -x^2 - 1 = 0 \to -x^2 = 1 \to x^2 = -1$ غ ق ق

$4 - x^2 + 3 = 0 \to -x^2 + 7 = 0 \to x^2 = 7 \to x = \pm\sqrt{7}$

(۳)

$4x^2 - 16x + m = 0$

$\alpha, \alpha + 2$

$\alpha + \alpha + 2 = 2\alpha + 2 = S = \frac{-b}{a} = \frac{16}{4} = 4 \to 2\alpha + 2 = 4 \to \alpha = 1 \quad \alpha + 2 = 3$

$\frac{c}{a} = P = 1 \times 3 = 3 \to \frac{m}{4} = 3 \to m = 12 \quad \alpha = 1 \quad \alpha + 2 = 3$

(۴)

$3x^2 - 6x + m - 1 = 0$

$2\alpha - \beta = 4 \to \beta = 2\alpha - 4$

$2\alpha - 4, \alpha \to S = 2\alpha - 4 + \alpha = 3\alpha - 4 = \frac{-b}{a} = \frac{6}{3} = 2 \to 3\alpha = 6 \to \alpha = 2$

$\frac{m-1}{3} = P = 0 \to m = 1 \qquad \beta = 0$

$m = 1$

(۵)

$-mx^2 + 4x + m^2 - 2 = 0$

$\frac{1}{\alpha}, \alpha \to \alpha \times \frac{1}{\alpha} = 1 = P = \frac{c}{a} = \frac{m^2 - 2}{-m} = 1 \to m^2 - 2 = -m$

$m^2 + m - 2 \to (m+2)(m-1) = 0$

$m = -2$ غ ق ق
$m = 1$ ق ق

$2x^2 + 4x + 2 \to \Delta > 0 \to 16 - 16 = 0$ ✗

$-x^2 + 4x - 1 = 0 \to 16 - 4 = 12 \quad \Delta > 0$ ✓

$m = 1$

P4PCO

Subject :
Year . Month . Date . ( )

(۶)

$x^2 - mx + 3 = 0$

$\alpha\beta^2 = 4$

$\alpha = \frac{4}{\beta^2} \quad \alpha\beta = \frac{4}{\beta^2} \times \beta = \frac{4}{\beta} = \frac{c}{a} = 3 \to 3\beta = 4 \to \beta = \frac{4}{3} \quad \alpha = \frac{9}{4}$

$\frac{9}{4} + \frac{4}{3} = \frac{43}{12} = \frac{-b}{a} = m \to m = \frac{43}{12} \quad \Delta > 0 \to x^2 - \frac{43}{12}x + 3 = 0$

$(\frac{43}{12})^2 - 12 \to \Delta > 0$ ✓

(۷)

$x^2 - 4x + m = 0$

$\alpha, 3\alpha \to S = 3\alpha + \alpha = 4\alpha = \frac{-b}{a} = 4 \to \alpha = 1$

$3\alpha^2 = P = 3 \times 1^2 = 3 = m \to m = 3$

(۸)

$x^2 - 7x + 2 = 0 \longrightarrow \alpha^2 + 2 = 7\alpha \xrightarrow{\div \alpha} \alpha + \frac{2}{\alpha} = 7$

$\alpha^3 + \frac{8}{\alpha^3} \Rightarrow \underbrace{(\alpha + \frac{2}{\alpha})}_{7}(\alpha^2 + \frac{4}{\alpha^2} - 2)$

$\frac{\alpha^4 + 4}{\alpha^2} \to \frac{(\alpha^2+2)^2 - 4\alpha^2}{\alpha^2} \Rightarrow \frac{(\alpha^2+2)^2}{\alpha^2} - 4 = 49 - 4 = 45$

$7 \times (45 - 2) = 301$

(۹)

$h(t) = -10t^2 + 50t \qquad -10t^2 + 50t = 0$

max $\frac{-b}{2a} = \frac{-50}{-20} = 2.5 \qquad t(-10t + 50) = 0 \qquad h_{max}$ 62.5

$62.5 \qquad t = 0 \quad t = 5s \qquad t = 5s$

(۱۰)

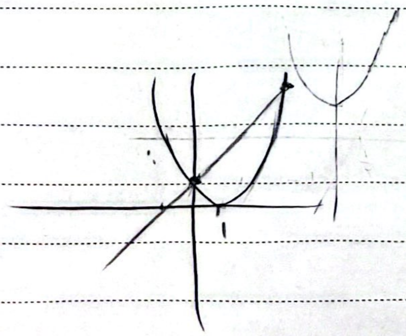
الف) $(x-1)^2 = 2x + 1$

$x^2 - 2x + 1 = 2x + 1$

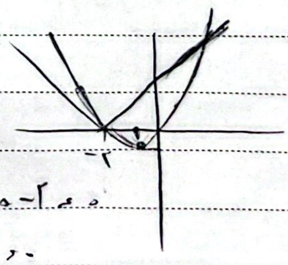
$x^2 - 4x = 0$

$x(x-4) = 0$

$x = 0, 4$



ب) $x^2 + 2x = |x + 2|$



$x^2 + 2x - x - 2 = 0$

$x^2 + x - 2 = 0$

$x = -2, 1$

PAPCO