به نام خدا

آتنا عطاپور

۲۰ آفرین

۱:

$y = a(x - x_0)^2 + y_0$

$y = a(x+\cancel{4})^2 + 9$

$a(2+1)^2 + 9 = 1$ $\qquad a = \frac{-1}{2}$

[illegible]

۲:

$\Delta > 0 \qquad S = \frac{-b}{a} = \frac{-m}{2} > 0 \Longrightarrow m < 0$

$P = \frac{m+6}{2} > 0 \Longrightarrow m > -6$

$\Delta = m^2 - 4(2)(m+6)$

$m^2 - 8m - 48 > 0$

$(m-12)(m+4) > 0$

$m > 12 \qquad m < -4$

$-6 < m < -4$

۳:

$3x^2 + (2m-1)x + 2 - m = 0$

$S = \frac{-b}{a} = \frac{-2m+1}{3}$

$P = \frac{c}{a} = \frac{2-m}{3}$ $\qquad S = \frac{1}{P}$

$\frac{-2m+1}{3} = \frac{3}{2-m}$ $\qquad 2m^2 + 2 - 5m = 9$

$m = -1 \qquad m = \frac{7}{2}$

اگر اینو بزاریم Δ منفی می‌شه که به درد نمی‌خوره

چون ریشه نداره

۴:

$x^2 - x - 4 = 0$

$S = 1$

$P = -4$

$\underbrace{x_1^3 + x_2^3 + \frac{x_1 + x_2}{x_1 x_2}}_{S^3 - 3SP + \frac{S}{P}} = 1 - 3(-4) - \frac{1}{4} = \frac{51}{4}$

$x_1^3 + x_2^3 + x_1^2 + x_2^2 + \frac{1}{x_1 x_2} = (-4)^3 + 1 - 2(-4) + \frac{1}{-4} = -\frac{221}{4}$

معادله $= x^2 - Sx + P$

$x^2 - \frac{51}{4}x - \frac{221}{4} = 0 \xrightarrow[\times 4]{} 4x^2 - 51x - 221 = 0$

مخرج را از بین بره

۵:

$\left(\sqrt[3]{x^2} + \frac{1}{\sqrt[3]{x^2}} + 1\right)\left(\sqrt[3]{x^2} - 1\right) = 2\sqrt[3]{x} \Rightarrow \left(\frac{\sqrt[3]{x^4} + 1 + \sqrt[3]{x^2}}{\sqrt[3]{x^2}}\right)\left(\sqrt[3]{x^2} - 1\right) = 2\sqrt[3]{x}$

$\frac{(\sqrt[3]{x^2})^3 - 1^3}{\sqrt[3]{x^2}} = 2\sqrt[3]{x} \rightarrow x^2 - 1 = 2x$

$x^2 - 2x - 1 = 0$

$4 - 4(-1) = 8 > 0$

$x_1 + x_2 = -\frac{-2}{1} = 2$

:6

$\alpha \times \frac{\alpha}{3} = \frac{4}{3} =$

$\alpha = \pm 2$

$\alpha = 2 \quad 12 - 4a + 4$

$\Downarrow$

$a = 8$

$8 + 8 = 16$

$\alpha = -2$

$12 + 4a + 4 = a = -8$

2

:7

$\textcircled{1}\ a > 0 \quad I \quad \frac{3 + 2a}{a} < 0 \rightarrow 3 + 2a < 0 \rightarrow 2a < -3 \rightarrow a < -\frac{3}{2} \quad II$

$\textcircled{2}\ -\frac{3 + 2a}{a}$

$I \cap II = \emptyset$

2

:8

$\frac{2}{-1} = \frac{-\alpha}{1} \qquad \alpha = 2$

$y = x^2 + 2x - 2 = 1 \rightarrow x^2 + 2x - 3 = 0$

$x = 1$

$x = -3$

$y = -(x-1)(x+3) + 1 = -x^2 - 2x + 4 \quad (b = 4)$

$4 \times 2 = 8$

2

:9

$\alpha = \alpha' + \frac{1}{2}$

$2(\alpha' + \frac{1}{2})^2 - a(\alpha' + \frac{1}{2}) + b = 2ax^2 + ax - 6 \rightarrow 2\alpha'^2 + (2 - a)\alpha' + \frac{1}{2} - \frac{a}{2} + b = 2ax^2 + ax - 6$

$2\alpha^2 + 2\alpha + \frac{1}{2} - a\alpha - \frac{a}{2} + b = 2ax^2 + ax - 6$

$2a = 2$

$a = 1$

$\frac{1}{2} - \frac{1}{2} + b = -6$

$b = -6$

$[\frac{ab}{4}] = \frac{-6}{4} = -2$

2

:10

$x^2 + 6x + m = x^2 + 2x - 3m \qquad 4x = -4m \quad x = -m$

$(-m)^2 + 6(-m) + m = 0 \rightarrow m^2 - 5m = 0$

$m(m - 5) = 0$

$\cancel{m = 0} \qquad m = 5$

$x^2 + 6x + 5$

$(x+1)(x+5)$

$-1 \quad -5$

$x^2 + 2x - 15 = 0$

$(x+5)(x-3)$

$-5 \quad 3$

$3 + 1 = 4$

2