Date: 1404/12/7

Sub: ۲۶ هستی سبزعلی ۴

① الف) $y = 3x^2 - 2x$ (min)

$x(3x-2)=0 \quad x=\frac{2}{3}$

$\frac{-b}{2a} = \frac{2}{6} = \frac{1}{3}$ از ناحیه سوم می گذرد

$\frac{1}{3}$, $-\frac{1}{3}$

۱ و ۲ و ۴ می گذرد

$y = -x^2 + 4x \quad a<0 \rightarrow max$

$x(-x+4) \quad x=4$

ب) $\frac{-4}{-2} = 2$

از کدوم نمی گذرد { اول و سوم و چهارم می گذرد

۴

---

②

$y = 2x^2 - 5x + 2 \quad \Delta \rightarrow b^2 - 4ac \rightarrow 25 - 4(2)(2) = 9$

$x = \frac{5 \pm \sqrt{9}}{4} \rightarrow x = 2, \quad x = \frac{1}{2}$

$\frac{-b}{2a} = \frac{-5}{4} = \frac{5}{4} \quad y = -\frac{9}{8}$

از ناحیه سوم نمی گذرد
۱ و ۲ و ۴ می گذرد

د) $-x^2 + 4x - 1 \quad \Delta = 16 - 4(-1)(-1) = 12$

$x = \frac{-4 \pm \sqrt{12}}{-2} \rightarrow 3/73, \quad 0/26$

max $\left| \frac{-b}{2a} = 2 \right.$ ۳

از ناحیه اول و سوم و چهارم می گذرد

Elipon

Date:

Sub:

حل تمرین سری اول

① $x^2 - x - 2 = 0$ الف) $\frac{\alpha+\beta}{\alpha-\beta} \rightarrow \frac{-b}{a} = \frac{+1}{1} = +1$

$\alpha - \beta = \frac{\sqrt{\Delta}}{a} = \frac{\sqrt{12}}{1} \rightarrow \frac{\alpha+\beta}{\alpha-\beta} = \frac{1}{\sqrt{12}} \frac{\sqrt{12}}{\sqrt{12}} = \frac{\sqrt{12}}{12}$

② $\alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta \rightarrow (1)^2 - 2(-2) = 5$

③ $\alpha^3 + \beta^3 = (\alpha+\beta)^3 - 3\alpha\beta(\alpha+\beta) = (1)^3 - 3(-2)(1) = 10$

④ $\alpha^3 - \beta^3 = (\alpha-\beta)^3 + 3\alpha\beta(\alpha-\beta) = \left(\frac{1}{\sqrt{12}}\right)^3 + 3(-2)\left(\frac{1}{\sqrt{12}}\right)$

$\frac{\sqrt{12}}{144} - \frac{9\sqrt{12}}{12 \times 12} = -\frac{114\sqrt{12}}{144}$

---

④ $x^2 - ax + \varepsilon$ معادله‌ی نقاط قطع می‌شود با $y = 0$

$\Delta < 0 \rightarrow a^2 - 4\varepsilon a < 0 \quad a(a - \varepsilon) < 0$

ε

---

⑤ $3x^2 - 12x - a = 0 \quad \alpha + \beta = \frac{12}{3} = 4 \quad \beta = 4 - \alpha$

$\alpha\beta = \frac{-a}{3} \quad \alpha\beta = 1 \times 3 = 3 \rightarrow \frac{-a}{3} = 3 \rightarrow -a = 9 \rightarrow a = -9$

$\frac{\alpha}{\beta} = -\frac{9}{3} = -3$ نسبت ریشه‌ها

$\begin{cases} 3\alpha^2 + \beta^2 - 4\alpha = 7 \\ 3\alpha^2 + (4-\alpha)^2 - 4\alpha = 7 \end{cases}$

$3\alpha^2 - 12\alpha + 16 = 7 \rightarrow 3\alpha^2 - 12\alpha + 9 = 0 \rightarrow (\alpha - 3)(\alpha - 1)$

$\frac{3}{3} = 1 \quad \frac{9}{3} = 3$

Elipon

Date: Sub: فهیمه سیدعلی

۶

$A(2a+3, a-2)$ $a-2 \geq 1 \rightarrow a \geq 3$

$B(7-2a, a-2)$ $2a+3 \neq 7-2a \Big\{ 4a \neq 4 \quad a \neq 1$

$a=3$

$S = \dfrac{2a+3+7-2a}{2} = 5$ $y = -\dfrac{1}{8}(0-5)^2+3 \Big\{ x=0$

فاصله تا مبدأ $= \sqrt{0^2+\left(-\frac{1}{8}\right)^2} = \dfrac{1}{8}$ $-\dfrac{25}{8}+3 = -\dfrac{1}{8}$ با برخورد با محور عرض‌ها

$A\ (9,1) \Big\{ B(1,1)$ $y = k(x-5)^2+3 \leftarrow$ از فرمول

$1 = 16k+3 \longrightarrow k = -\dfrac{1}{8}$ $y = -\dfrac{1}{8}(x-5)^2+3$

۷

$ax^2 - ax - b = 0$ $\alpha+\beta = -\dfrac{-a}{a} = 1$

$\beta = 1-\alpha$ $40\beta^2 + 20\alpha^2 - 20\beta = 17$ $40(1-\alpha)^2 + 20\alpha^2$

$-20(1-\alpha) = 17 \Big\{ 60\alpha^2 - 60\alpha + 3 = 0 \Big\} \alpha^2 - \alpha + \dfrac{1}{20} = 0$

$\Delta = \dfrac{4}{5}$ $|\alpha_1 - \alpha_2| = \dfrac{\sqrt{\Delta}}{a} = \dfrac{\frac{2}{\sqrt{5}}}{1} = \dfrac{2\sqrt{5}}{5}$

۸

$(-5, \beta), (1, \beta)$ $y = a(x+2)^2 - \dfrac{1}{2}$

راس $= \dfrac{1+(-5)}{2} = -2$ $\dfrac{3}{2} = a(0+2)^2 - \dfrac{1}{2} \rightarrow \dfrac{3}{2} = 4a - \dfrac{1}{2}$

$4a = 2 \rightarrow a = \dfrac{1}{2}$

Date: Sub:

$y = (x+2)^2 - \frac{1}{4} \longrightarrow \beta = \frac{1}{4}(1+2)^2 - \frac{1}{2}$

$\beta = \frac{1}{4} = \varepsilon$

$x^2 + 4x + a = 0 \quad \alpha + \beta = -4 \quad \alpha\beta = a$ (1)

$x = -4 \pm \sqrt{16 - \varepsilon a} \longrightarrow 16 - \varepsilon a = \varepsilon(9-a)$

$\frac{-4 \pm 2\sqrt{9-a}}{2} = -2 \pm \sqrt{9-a} \longrightarrow \alpha = -2 - \sqrt{9-a}$

$\alpha = -2 - \sqrt{9-a}$

$12\alpha^2 + 12\beta^2 = 12\sqrt{2} + 18a \longrightarrow \alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$(-4)^2 - 2a = 16 - 2a \qquad \beta = -2 + \sqrt{9-a}$

$\longrightarrow 12\alpha^2 + 12\beta^2 + \alpha^2 = 12(16 - 2a) + \alpha^2$

$72 - 8a + 18 - a + 4\sqrt{9-a} = 12\sqrt{2} + 18a$

$\beta = -2 + \sqrt{9-a} \qquad a < \beta < 0$

$20 - 20a + 4\sqrt{9-a} = 12\sqrt{2} \longrightarrow 4\sqrt{9-a} = \frac{20a - 20}{4}$

$(\sqrt{9-a})^2 = \left(\frac{20a-20}{4} + 2\sqrt{2}\right)^2$

$9 - a = \frac{(20\alpha - 20)^2}{16} + 18 + \frac{12(20\alpha - 20)}{8} \longrightarrow$ (1)

Date: Sub: حل سؤال

(10)

$4x^2 - (m+1)x + 1 = 0 \quad (\alpha+\beta) = \frac{m+1}{4}$

$\alpha\beta = \frac{1}{4} \longrightarrow (\sqrt{\alpha}+\sqrt{\beta})^2 = \alpha+\beta+2\sqrt{\alpha\beta}$

$\frac{1}{4}$

$\frac{2a}{4} = \frac{m+1}{4} + \frac{1}{2} \longrightarrow \frac{2a}{4} = \frac{m+4}{4}$ (-1)

حاصل جمع ریشه‌ها: $\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 0 \quad \frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = \frac{\sqrt{\beta}+\sqrt{\alpha}}{\sqrt{\alpha\beta}} = 0$

$4(\sqrt{\beta}+\sqrt{\alpha}) = 0 \quad \sqrt{\beta}+\sqrt{\alpha} = \frac{0}{4}$

$\frac{1}{2}$

$mx^2 + 2x + 2 = 0 \longrightarrow m = -1 \longrightarrow -x^2 + 2x + 2 = 0$

$P = \frac{c}{a} = \frac{2}{-1} = -2$