8-

$$\frac{1-5}{2} = -2 \Rightarrow x_s \qquad \begin{vmatrix} -2 \\ -\frac{1}{2} \end{vmatrix}$$

$$y = a(x - x_s)^2 + y_s$$

$$\frac{3}{2} \quad\quad 0 \quad\quad -2 \quad\quad -\frac{1}{2}$$

$$\frac{3}{2} = 4a - \frac{1}{2} \qquad \boxed{a = 2}$$

$$y = 2x^2 + 8x - \frac{1}{2}$$

$$\div 2 \quad x^2 + 4 + 4x - \frac{1}{4}$$

$$y = x^2 + 4x + 3.75$$

9-

$$x^2 + 6x + a = 0 \quad \begin{cases} \alpha = -3 + \sqrt{9-a} \longrightarrow \alpha^2 = 18 - a - 6\sqrt{9-a} \\ \beta = -3 - \sqrt{9-a} \longrightarrow \beta^2 = 18 - a + 6\sqrt{9-a} \end{cases}$$

$$3\alpha^2 + 2\beta^2 = 90 - 5a - 6\sqrt{9-a} = 12\sqrt{2} + 85 \longrightarrow 5a + 6\sqrt{9-a} = 5 + 6\sqrt{8}$$

$$\longrightarrow a = 1$$

10-

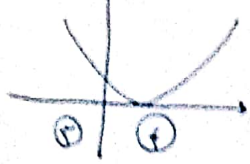
$$\frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = 5 \rightarrow \frac{\sqrt{\alpha} + \sqrt{\beta}}{\sqrt{\alpha\beta}} = 5 \longrightarrow \sqrt{\alpha} + \sqrt{\beta} = 5\sqrt{\alpha\beta}$$

$$S + 2\sqrt{P} = 25P \rightarrow S + 2\sqrt{\frac{1}{36}} = \frac{25}{36} \longrightarrow S = \frac{25}{36} - \frac{1}{3} = \frac{13}{36}$$

$$\rightarrow \frac{m+14}{36} = \frac{13}{36} \longrightarrow \boxed{m = -1}$$

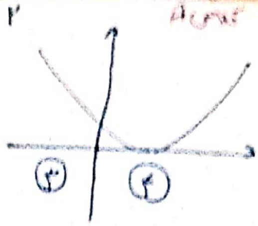
$$mx^2 + 3x + 2 = -x^2 + 3x + 2 \rightarrow P = -2$$

الف) ext_{min} | $x_s = \frac{1}{2}$, $y_s = 0$



از ربع ۳ و ۴ نمی‌گذرد

ب) ext_{max} | $x_s = 2$, $y_s = 0$



از ربع ۳ و ۴ نمی‌گذرد

-۱

الف) ext_{min} | $x_s = \frac{5}{4}$

$y_s = \frac{-(16 - 4a \cdot 1 \cdot -1)}{-4} = 3$ ($16-4=12$)

از ① و ② و ③ نمی‌گذرد

ب) ext_{max} | $x_s = \frac{-4}{-2} = 2$, $y_s = -4 + 8 - 1 = 3$

از ① و ② نمی‌گذرد

-۲

-۳

$x^2 - x - 3 = 0$ → $-\frac{b}{a} = +1 \Rightarrow +$; $\frac{c}{a} = -3 \Rightarrow \times$

• $\frac{\alpha+\beta}{\alpha-\beta} = \frac{+1}{\frac{\sqrt{\Delta}}{|a|}} \Rightarrow \frac{\sqrt{13}}{1}$ $= \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

• $\alpha^2+\beta^2 \Rightarrow (\underbrace{\alpha+\beta}_{1})^2 - \underbrace{2\alpha\beta}_{6} = 7$

• $\alpha^3+\beta^3 = S^3 - 3SP = 1^3 - 3\times 1 \times -3 = 1 + 9 = 10$

• $\alpha^3-\beta^3 = (\underbrace{\alpha-\beta}_{\frac{\sqrt{13}}{13}})(\underbrace{\underbrace{\alpha^2+\beta^2}_{7} + \underbrace{\alpha\beta}_{-3}}_{4}) = \frac{\sqrt{13}}{3}$

-۴

$y = (x-2)(\underbrace{x^2 - ax + a}_{\Delta<0})$

تماس $x = 2$

$a^2 - 4a < 0$

$a(a-4) < 0$ → 0 , 4

$+ \; 0 \; - \; 4 \; +$

$0 < a < 4$

-۵

$\alpha + \beta = 4$

$\alpha\beta = -\frac{a}{3}$

$\beta = 4 - \alpha$

$(4-\alpha)^2 - \alpha^2 - 4(4-\alpha) = 7$

$2\alpha^2 + 16 - 8\alpha + \alpha^2 - 4\alpha = 7$

$3\alpha^2 - 12\alpha + 16 = 7$ $\quad 3\alpha^2 - 12\alpha + 9 = 0 \xRightarrow{\div 3} \alpha^2 - 4\alpha + 3 = 0$

$(\alpha-1)(\alpha-3) = 0$ → 1 , 3

$\alpha\beta = 3 = -\frac{a}{3}$, $\boxed{a = -9}$ $\quad -\frac{9}{3} = \boxed{-3}$

-۶

$\frac{7 - 2a + 2a + 3}{2} = b = 5 \Rightarrow x_s \Rightarrow y_s = 3$

$\boxed{a = 3}$ $\quad y = a(x - x_s)^2 + y_s$ (1 ، 1 ، 5 ، 3)

$a = \frac{1}{8}$

$(a > 2) \Rightarrow 4, 5, 6 \ldots \times \Rightarrow a' \Rightarrow x < 0 \; \times \Rightarrow$ غلط

-۷

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

$\alpha + \beta = 1$ $\quad \alpha = 1 - \beta$

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

$60\alpha^2 - 60\alpha + 3 = 0$ $\quad \alpha^2 - \alpha + \frac{1}{20} = 0 \Rightarrow 1 - 4(1)(\frac{1}{20}) = \frac{4}{5}$

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