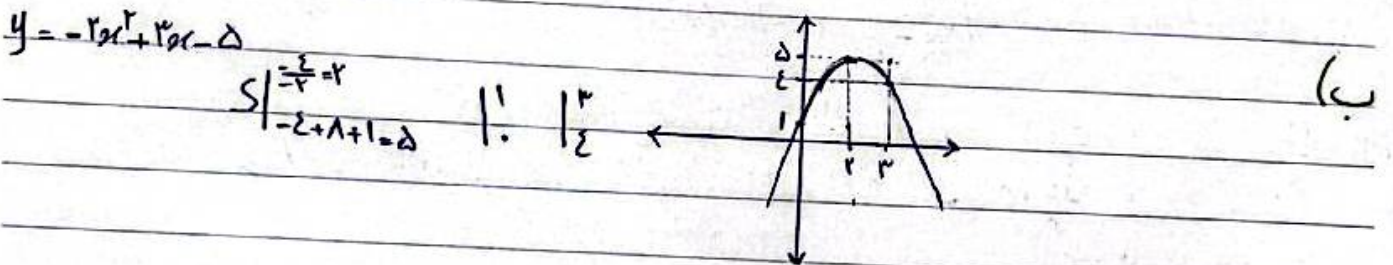
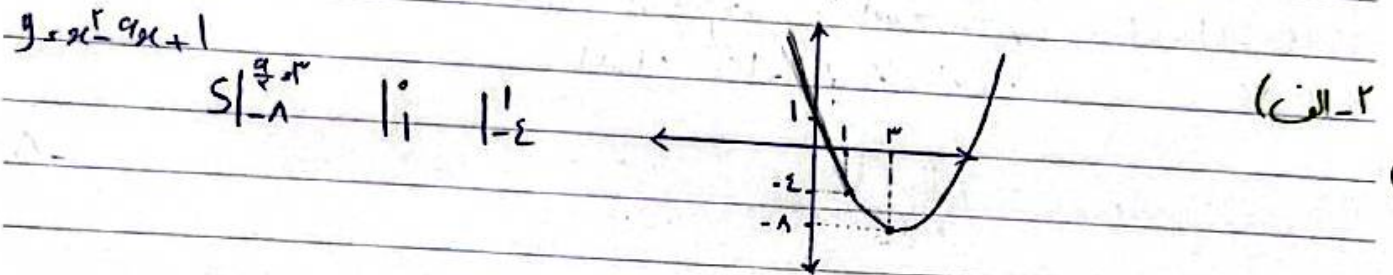


$$y_{min} = \frac{-\Delta}{2a} = \frac{-b^2 + 4ac}{2a} = \frac{-16 + 16}{2} = -1 \quad \text{Min} \quad \left| \begin{matrix} 1 \\ -1 \end{matrix} \right.$$

$$x_{min} = \frac{-b}{2a} = \frac{-(-2)}{2 \times 2} = \frac{2}{4} = 1 \quad \text{الف-1}$$

$$y_{max} = \frac{-\Delta}{2a} = \frac{-b^2 + 4ac}{2a} = \frac{-4 + 16}{-2} = \frac{12}{-2} = -6 \quad \text{Max} \quad \left| \begin{matrix} 1 \\ -6 \end{matrix} \right.$$

$$x_{max} = \frac{-b}{2a} = \frac{-3}{2 \times (-1)} = \frac{3}{-2} = -1.5 \quad \text{ب}$$



3

$$2x^2 + kx - 9x - 2 = 0$$

$S_1 \times S_2 = -2, P_1 \times P_2 = 1 \Rightarrow \alpha + \beta = 1 \Rightarrow \beta = 1 - \alpha \Rightarrow \alpha(1 - \alpha) = -2 \Rightarrow \alpha - \alpha^2 = -2 \Rightarrow \alpha^2 - \alpha - 2 = 0 \Rightarrow (\alpha - 2)(\alpha + 1) = 0$

$\begin{cases} \alpha = 2, \beta = -1 \\ \alpha = -1, \beta = 2 \end{cases} \Rightarrow \begin{cases} 2 \times 1 + k - 9 - 2 = 0 \Rightarrow k = 8 \\ -1 + k + 9 - 2 = 0 \Rightarrow k = -6 \end{cases} \Rightarrow k = -6$

4

$$2x^2 - 3mx + m = 0 \quad |\sqrt{a} - \sqrt{b}| = 1 \Rightarrow (\sqrt{a} + \sqrt{b})^2 = 1 \Rightarrow \alpha + \beta - 2\sqrt{\alpha\beta} = 1$$

$$3m - 2\sqrt{m} - 1 = 0 \quad (3\sqrt{m} + 1)(\sqrt{m} - 1) = 0 \Rightarrow \sqrt{m} = 1 \Rightarrow m = 1$$

$m = 1 \Rightarrow 2x^2 - 3x - 1 = 0 \quad \alpha, \beta, S, C = \frac{-1}{2}$

5

$$S = \frac{m(\sqrt{\Delta})}{2a} = \frac{3}{2} \Rightarrow \frac{m(\sqrt{(m+3)^2 - 4m})}{2} = \frac{3}{2} \Rightarrow m(\sqrt{(m+3)^2 - 4m}) = 3 \Rightarrow m(m-2) = 0$$

$m < 2 \Rightarrow m^2 - 2m + 3 = 0$ (no real roots)

$m > 2 \Rightarrow m^2 - 2m + 3 = 0 \Rightarrow m = 3 \quad m = 1$ (no real roots)

$m = 3 \Rightarrow y = 2x^2 - 3x + 1 = x^2 + x + 1$ طول راس $= \frac{-b}{2a} = \frac{3}{4}$

$$y = ax^2 + 2cx + a \Rightarrow y_{\min} = \frac{V}{\lambda} \quad (a > 0) \quad \frac{\Delta}{\epsilon a} = \frac{V}{\lambda} \quad \frac{4 + \epsilon a^2}{\epsilon a} = \frac{V}{\lambda} \Rightarrow -r(4 - \epsilon a^2) = Va \quad (-9)$$

$$\lambda a^2 - Va - \lambda = 0 \quad \Delta = \epsilon a + \epsilon x \lambda x \lambda = 4r a \Rightarrow a_1, a_2 = \frac{V \pm \sqrt{4r a}}{14}$$

$$\begin{cases} a_1 = \frac{r}{14} = r \\ a_2 = -\frac{\lambda}{14} \quad (\frac{-\lambda}{14} < 0) \text{ غير ممكن} \end{cases} \quad a = r$$

$$x^2 - (a+1)x + a = 0 \quad (r = 2) \quad \frac{\sqrt{\Delta}}{|a|} = r \quad \sqrt{(a+1)^2 - \epsilon a} = r$$

$$(a+1)^2 - \epsilon a = r^2 \Rightarrow (a-1)^2 = \epsilon \quad (a-1-r)(a-1+r) = 0 \Rightarrow (a-2)(a+1) = 0 \Rightarrow \begin{cases} a=1 \\ a=-1 \end{cases}$$

$$x^2 - (2a+1)x + b = 0 \quad (r = 2) \Rightarrow \frac{\sqrt{\Delta}}{|a|} = r \Rightarrow \sqrt{1 - \epsilon b} = r \Rightarrow 1 - \epsilon b = r^2 \Rightarrow b = \frac{1-r^2}{\epsilon}$$

$$P_2 = b = r^2 \quad \text{مقدار اولی} = |P_2 - P_1| = |r^2 - r| = r$$

① $y = -ax^2 + ax + r \quad S_1 \mid \begin{matrix} \frac{a}{\epsilon} - \frac{1}{\epsilon} \\ \frac{a}{\epsilon} + \frac{a}{\epsilon} + r = \frac{a+1}{\epsilon} \end{matrix} \quad -\lambda$

② $y = rbx^2 - bx - 1 \quad S_2 \mid \begin{matrix} \frac{rb}{\epsilon} + \frac{1}{\epsilon} \\ \frac{rb}{\epsilon} + \frac{b}{\epsilon} - 1 = \frac{(b+1)}{\lambda} \end{matrix}$

③ $\frac{rb}{\epsilon} - \frac{b}{\epsilon} - 1 = \frac{a+1}{\epsilon} \Rightarrow a+1 = -1 \Rightarrow a+1 = -\epsilon \Rightarrow a = -1 - \epsilon$

$$\frac{-a}{14} + \frac{a}{\epsilon} + r = \frac{(b+1)}{\lambda} \Rightarrow \frac{-a + \epsilon a + 14r}{14} = \frac{(b+1)}{\lambda} \Rightarrow -r = -(b+1) \Rightarrow b = -4$$

$$b - a = -4 + 1 = -3$$

$a + b = S \quad a + b = P \quad S(S - 1) = P(P - 1) \Rightarrow S^2 - rS - 1 = P^2 - rP - 1 \Rightarrow S^2 - rS - 1 = P^2 - rP - 1$

$P = a + b - 1 = S - 1 \Rightarrow P^2 - rP - 1 = S^2 - rS - 1 = S$

$S^2 - rS - 1 = 0 \quad (S-1)(S+1) = 0 \Rightarrow S = 2 \text{ or } S = -2 \Rightarrow a + b = 2 - r$