

$$q_1^2 - 11q_1 + 28 = (q_1 - 4)(q_1 - 7) \Rightarrow \left. \begin{matrix} q_1 = 7 \\ q_1 = 4 \end{matrix} \right\}$$

(الف)

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$$q_1^2 + 3q_1 - 28 = (q_1 + 7)(q_1 - 4) = 0 \Rightarrow \left. \begin{matrix} q_1 = -7 \\ q_1 = 4 \end{matrix} \right\}$$

(ب)

$$6q_1^2 - 12q_1 + 4 = 0 \Rightarrow q_1^2 - 2q_1 + \frac{2}{3} = (q_1 - 1)(q_1 - \frac{2}{3}) = 0 \Rightarrow \left. \begin{matrix} q_1 = 1 \\ q_1 = \frac{2}{3} \end{matrix} \right\}$$

(الف)

$$3q_1^2 - 10q_1 + 4 = q_1^2 - 10q_1 + 21 = 0 \Rightarrow (q_1 - 3)(q_1 - 7) = 0 \Rightarrow \left. \begin{matrix} q_1 = \frac{3}{3} = 1 \\ q_1 = \frac{7}{3} \end{matrix} \right\}$$

(ب)

$$aq_1^2 + bq_1 + c \Rightarrow 2q_1^2 - 6q_1 + 3 = 0 \Rightarrow a+b+c=0 \Rightarrow q_1 = 1, q_1 = \frac{c}{a} = \frac{3}{2}$$

(الف)

$$2q_1^2 + 6q_1 + 3 = 0 \Rightarrow a+c=b \Rightarrow q_1 = -1, q_1 = -\frac{c}{a} = -\frac{3}{2}$$

(ب)

$$2q_1^2 - 6q_1 + 1 = 0 \Rightarrow \Delta = b^2 - 4ac \Rightarrow 6 = 26 - 12 = 14 \Rightarrow q_1 = \frac{6 \pm \sqrt{14}}{2}$$

(ج)

$$4q_1^2 + 12q_1 + 9 = 0 \Rightarrow \Delta = 49 - 144 = -95 < 0 \Rightarrow \text{ریشه های حقیقی ندارد}$$

(د)

$$\text{محل تقاطع درجه اول و دوم} = p = \frac{c}{a} = -2$$

(۲)

$$S^2 - 2p = (3)^2 - 2(-2) = 9 + 4 = 13$$

(الف)

$$S^3 - 3SP = (3)^3 - 3(3)(-2) = 27 + 18 = 45$$

(ب)

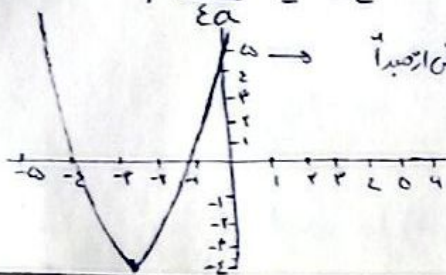
$$\begin{pmatrix} 1 \\ 6 \end{pmatrix} + \begin{pmatrix} 4 \\ 2 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} + \begin{pmatrix} 4 \\ 2 \end{pmatrix} = \frac{1 \times 4}{2} + \frac{4 \times 1}{2} = 2 + 2 = 4$$

(الف)

$$\begin{pmatrix} 4 \\ 3 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \frac{4 \times 1}{3 \times 2} - \frac{1 \times 2}{3} = \frac{4}{6} - \frac{2}{3} = \frac{4 - 4}{6} = 0$$

(ب)

$$a > 0 \rightarrow \min U = \begin{cases} \frac{-b}{2a} = -3 \\ \frac{-c}{\varepsilon a} = -\varepsilon \end{cases}$$



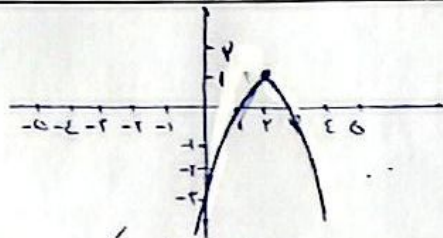
دکله دیکر محدودیت ها را قطع می کند ۱ عددی از صبر

(الف)

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(ب)

$$a < 0 \rightarrow \max \Pi = \begin{cases} \frac{-b}{2a} = 2 \\ \frac{-c}{\varepsilon a} = 1 \end{cases}$$



(الف)

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(ب) وقتی می دیکر محدودیت ها را درجه ناقص قطع می کند یعنی باید همیشه کار را درست بیاوریم:
 $y = -a_1^2 + \varepsilon a_1 - 2 \Rightarrow a + b + c = 0 \Rightarrow a_1 = 1$, $a_1 = \frac{c}{a} = 3$

$$\Delta = b^2 - \varepsilon ac \Rightarrow \Delta = 4 - 1a > 0 \rightarrow a < 4 \Rightarrow a_{1/2} > a$$

(الف) یعنی $\Delta > 0$

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$$\Delta = 4 - 1a = 0 \Rightarrow a = 4 \Rightarrow a = a_{1/2}$$

(ب) یعنی $\Delta = 0$

$$\Delta = 4 - 1a < 0 \Rightarrow a > 4 \Rightarrow a_{1/2} < a$$

(ج) یعنی $\Delta < 0$

$$\Delta = 4 - 1a > 0 \rightarrow a < 4 \Rightarrow a_{1/2} > a$$

(د) یعنی $\Delta > 0$

$$a^2 - 2a - 1 + 2 = 2 \Rightarrow a^2 - 2a + 1 = 2 \Rightarrow (a-1)^2 = 2 \Rightarrow a-1 = \pm\sqrt{2}$$

$$a = 1 \pm \sqrt{2}$$

(الف)

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$$a^2 + a - 1 \Rightarrow a^2 - a - 1 + \frac{1}{\varepsilon} = \frac{1}{\varepsilon} \Rightarrow (a - \frac{1}{\varepsilon})^2 - 1 = \frac{1}{\varepsilon} \Rightarrow (a - \frac{1}{\varepsilon})^2 = \frac{1}{\varepsilon} + 1$$

$$a - \frac{1}{\varepsilon} = \pm \frac{\sqrt{\varepsilon + 1}}{\varepsilon} \Rightarrow a = \frac{1}{\varepsilon} \pm \frac{\sqrt{\varepsilon + 1}}{\varepsilon} = \frac{1 \pm \sqrt{\varepsilon + 1}}{\varepsilon}$$

(ب)

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$$a^2 - 2a - 1 \Rightarrow \Delta = b^2 - \varepsilon ac = 4 + \varepsilon = 4 \Rightarrow a = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow a = \frac{2 \pm \sqrt{4}}{2} = 1 \pm \sqrt{2}$$

(الف)

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$$a_1 = 1 + \sqrt{2}, a_2 = 1 - \sqrt{2}$$

$$a^2 + a - \varepsilon = 0 \Rightarrow \Delta = b^2 - \varepsilon ac = 1 + 4 = 5 \Rightarrow a = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow a = \frac{-1 \pm \sqrt{5}}{2}$$

(ب)

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$$a = \frac{-1 \pm \sqrt{5}}{2}$$