

الف) $2x^2 + 4x - 1 = 0 \Rightarrow \Delta = 2^2 - 4 \cdot (-1) = 13 > 0 \Rightarrow$ دو ریشه

ب) $x^2 - x + 2 = 0 \Rightarrow \Delta = 1 - 1 \cdot 2 = -1 < 0 \Rightarrow$ ریشه ندارد

ج) $x^2 - 4x + 2 = 0 \Rightarrow \Delta = 16 - 4 \cdot 1 \cdot 2 = 8 > 0 \Rightarrow$ دو ریشه (2) ✓

د) $x^2 - x + 1 = 0 \Rightarrow \Delta = 1 - 4 \cdot 1 \cdot 1 = -3 < 0 \Rightarrow$ ریشه ندارد

الف) $\Delta > 0 \Rightarrow 9 - 4a > 0 \Rightarrow 4a < 9 \Rightarrow a < \frac{9}{4}$

ب) $\Delta = 0 \Rightarrow 9 - 4a = 0 \Rightarrow a = \frac{9}{4}$

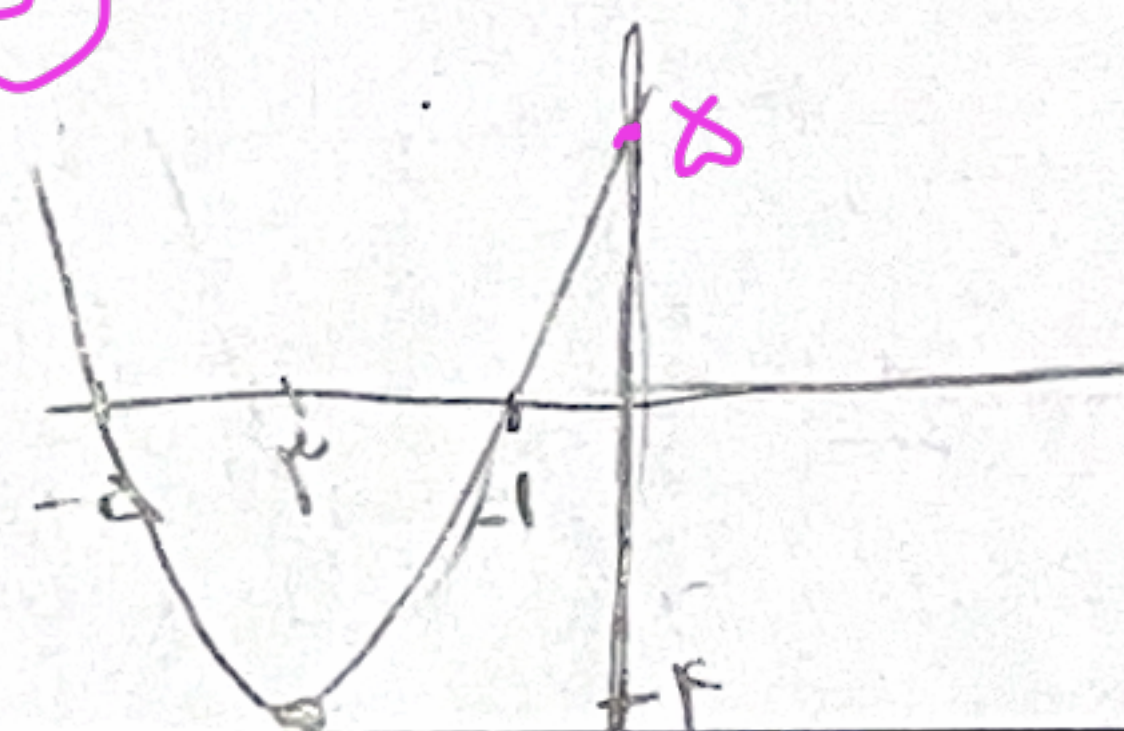
ج) $\Delta < 0 \Rightarrow 9 - 4a < 0 \Rightarrow a > \frac{9}{4}$

د) $\Delta \geq 0 \Rightarrow 9 - 4a \geq 0 \Rightarrow a \leq \frac{9}{4}$ (2) ✓

الف) $\text{ext} \left| \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4ac} \end{array} \right| \Rightarrow \left| \begin{array}{l} -\frac{4}{2 \cdot 1} = -2 \\ -\frac{(16 - 4a)}{4 \cdot 1 \cdot 1} = -\frac{4 - a}{1} \end{array} \right| \Rightarrow \min \Rightarrow a > 0$ (2) ✓

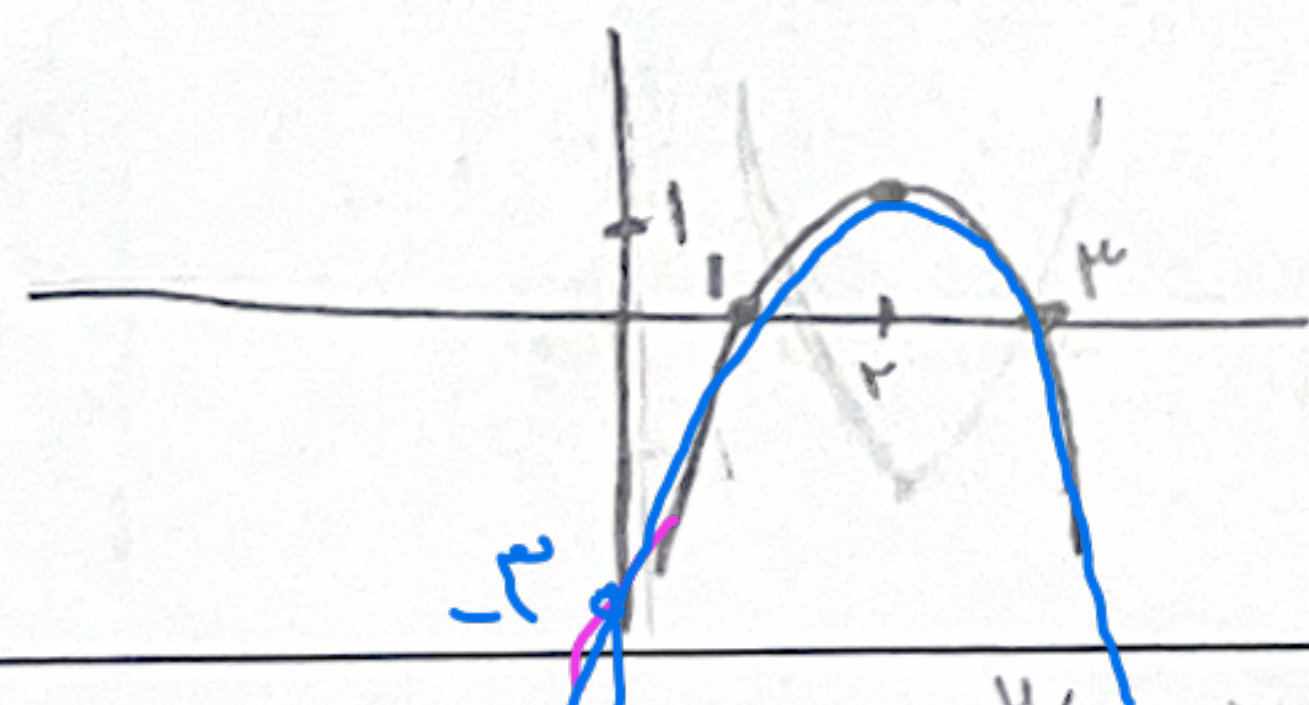
$y = x^2 + 4x + a$
 $(x+1)(x+a)$
 $\left\{ \begin{array}{l} x = -a \\ x = -1 \end{array} \right.$

ب) $y = x^2 + 4x + a \Rightarrow \left| \begin{array}{l} -2 \\ -\frac{4-a}{1} \end{array} \right|$ ✓



الف) $\text{ext} \left| \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4ac} \end{array} \right| \Rightarrow \left| \begin{array}{l} -\frac{4}{2 \cdot (-1)} = +2 \\ -\frac{(16 - 4a)}{4 \cdot (-1) \cdot 1} = +\frac{4-a}{1} \end{array} \right| \Rightarrow a < 0 = \max$

$y = -x^2 + 4x + a$
 $y = -(x-1)(x-3)$
 $\left\{ \begin{array}{l} x = 1 \\ x = 3 \end{array} \right.$



(2) ✓

الف) $S = \frac{b}{a} = \frac{+4}{1} = 4$, $P = \frac{c}{a} = -1 \Rightarrow S^2 - 2P = 16 - 2 = 14$

ب) $S^2 - 2SP = 16 + 11 = 27$ ✓ (2) ✓