

الف - $y = 4x^2 - 2x$ $a > 0 \rightarrow \text{Min}$
 $S = \frac{b^2}{4a} = \frac{1}{4}$
 $\Delta = b^2 - 4ac = 4 - 0 = 4$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{1 \pm 2}{4}$
 $x_1 = \frac{3}{4}, x_2 = -\frac{1}{4}$
 نمودار:

ب - $y = -x^2 + x$ $a < 0 \rightarrow \text{Max}$
 $S = \frac{b^2}{4a} = -\frac{1}{4}$
 $\Delta = b^2 - 4ac = 1 - 0 = 1$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{1 \pm 1}{-2}$
 $x_1 = 0, x_2 = 1$
 نمودار:

الف - $y = 2x^2 - 5x + 2$ $a > 0 \rightarrow \text{Min}$
 $S = \frac{b^2}{4a} = \frac{25}{16}$
 $\Delta = b^2 - 4ac = 25 - 16 = 9$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm 3}{4}$
 $x_1 = 2, x_2 = \frac{1}{2}$
 نمودار:

ب - $y = -x^2 + x - 1$ $a < 0 \rightarrow \text{Max}$
 $S = \frac{b^2}{4a} = -\frac{5}{4}$
 $\Delta = b^2 - 4ac = 1 - 4 = -3$
 نمودار:

الف - $\alpha + \beta = 0$
 $\alpha - \beta = 1$
 $\Delta = 1 - 0 = 1$
 $\alpha = \frac{1}{2}, \beta = -\frac{1}{2}$
 $P = \frac{c}{a} = -\frac{1}{2}$

ب - $\alpha^2 + \beta^2 = 1 + 9 = 10$
 $\alpha^2 - \beta^2 = (\alpha - \beta)(\alpha + \beta) = 1 \cdot 0 = 0$
 $\alpha = 1, \beta = -1$

الف - $y = (x-2)(x^2 - \alpha x + a)$
 $\Delta = 0$
 $\Delta = a^2 - 4a = 0$
 $a(a-4) = 0$
 $a = 0$ یا $a = 4$
 $(x-2)^2 = x^2 - 4x + 4$

ب - $\cos 45^\circ = \frac{\sqrt{2}}{2}$

الف - $3x^2 - 12x - a = 0$
 $\Delta = 144 + 12a = 0$
 $a = -12$
 $\alpha = 4, \beta = -4$
 $\alpha^2 + \beta^2 = 16 + 16 = 32$
 $\alpha^2 - \beta^2 = 0$
 $\alpha = 4, \beta = -4$

ب - $3x^2 - 12x + 9 = 0$
 $x^2 - 4x + 3 = 0$
 $(x-1)(x-3) = 0$
 $x_1 = 1, x_2 = 3$
 $\alpha = 1, \beta = 3$
 $\alpha^2 + \beta^2 = 1 + 9 = 10$

