

الف) $x^2 - 6x + 1 = 0 \xrightarrow{+1} x^2 - 6x + 9 = 1 \rightarrow (x-3)^2 = 1 \rightarrow |x-3| = 1$

$x-3 = \pm 1 \quad x = 4 \quad x = 2$

ب) $x^2 + 11x + 7 = 0 \xrightarrow{+9} x^2 + 11x + 16 = 9 \rightarrow (x+4)^2 = 9 \rightarrow \sqrt{(x+4)^2} = \sqrt{9}$

$|x+4| = 3 \rightarrow x+4 = \pm 3 \quad x = -7 \quad x = -1$

الف) $x^2 - 5x + 6 = 0 \rightarrow (x-2)(x-3) \quad x = 2 \quad x = 3$

ب) $x^2 - 5x - 14 = 0 \rightarrow (x-7)(x+2) \quad x = 7 \quad x = -2$

الف) $x^2 - 3x - 5 = 0$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{3 \pm \sqrt{9 + 20}}{2} \quad x = \frac{3 \pm \sqrt{29}}{2}$

ب) $2x^2 - 4x + \frac{1}{2} = 0$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-2 \pm \sqrt{16 - 2}}{4} \quad x = \frac{-2 \pm \sqrt{14}}{4}$

الف) $x^2 - 3x + 2 = 0 \quad (x-1)(x-2) = 0 \quad x = 1 \quad x = 2$

ب) $4x^2 + x - 3 = 0$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1 + 48}}{8} = \frac{-1 \pm 7}{8}$

$x = -1 \quad x = \frac{6}{8} = \frac{3}{4}$

الف) ⑤ $x^2 - 12x + 7 = 0 \quad x^2 - 12x + 35 = 0 \quad (x-5)(x-7) = 0$

$x = \frac{7}{5} \quad x = 1$

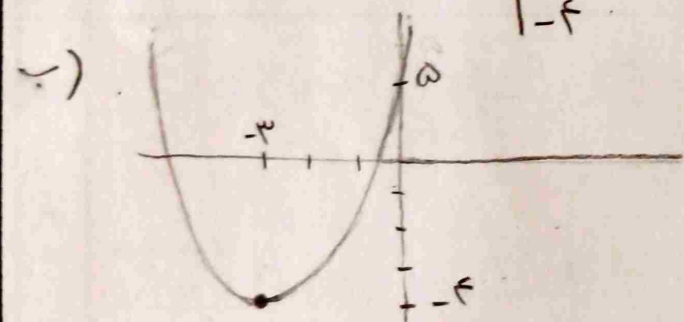
ب) ③ $3x^2 - 10x + 7 = 0 \quad x^2 - 10x + 21 = 0 \quad (x-3)(x-7) = 0$

$x = \frac{7}{3} \quad x = 1$

الف) $-3x^2 + 5x - 1 = 0$ $\Delta = b^2 - 4ac \rightarrow 25 - 12 = 13$ $\Delta > 0 \rightarrow$ دارای ۲ ریشه
 ب) $2x^2 - x + 2 = 0$ $\Delta = b^2 - 4ac \rightarrow 1 - 16 = -15$ $\Delta < 0 \rightarrow$ بدون ریشه
 ج) $2x^2 - 4x + 2 = 0$ $\Delta = b^2 - 4ac \rightarrow 16 - 16 = 0$ $\Delta = 0 \rightarrow$ دارای ۱ ریشه
 د) $2x^2 - x + 1 = 0$ $\Delta = b^2 - 4ac \rightarrow 1 - 8 = -7$ $\Delta < 0 \rightarrow$ بدون ریشه

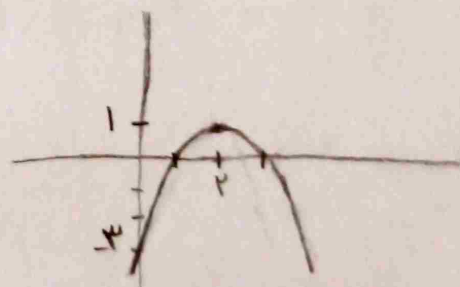
الف) $\Delta > 0$, $\Delta = b^2 - 4ac \rightarrow 9 - 12a > 0$ $-12a > -9$ $a < \frac{3}{4}$
 ب) $\Delta = 0$, $\Delta = b^2 - 4ac \rightarrow 9 - 12a = 0$ $-12a = -9$ $a = \frac{3}{4}$
 ج) $\Delta < 0$, $\Delta = b^2 - 4ac \rightarrow 9 - 12a < 0$ $-12a < -9$ $a > \frac{3}{4}$
 د) $\Delta \geq 0$, $\Delta = b^2 - 4ac \rightarrow 9 - 12a \geq 0$ $-12a \geq -9$ $a \leq \frac{3}{4}$

الف) $a > 0 \rightarrow \text{ext} | \min$ $\left| \frac{-b}{2a} = \frac{-4}{2} = -2 \right.$ $y = x^2 + 4x + 5$
 $-f = 9 - 16 + 5$



الف) $\text{ext} | \max$ $\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right.$ $y = -x^2 + 4x - 3$
 $1 = -4 + 16 - 3$

ب) $-x^2 + 4x - 3 = 0$ $\frac{a+b+c=0}{\rightarrow} x=1$ $x = \frac{c}{a} = 3$



$S = \frac{-b}{a} = 3$ $P = \frac{c}{a} = -2$

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

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