

الف) $x^2 - 4x + 8 = 0 \xrightarrow{+4} x^2 - 4x + 4 = -4 \rightarrow (x-2)^2 = -4$
 $x-2 = \pm 2i \rightarrow x = 2 \pm 2i$

ب) $x^2 + 8x + 17 = 0 \xrightarrow{+9} x^2 + 8x + 14 = -9 \rightarrow (x+4)^2 = -9$
 $x+4 = \pm 3i \rightarrow x = -4 \pm 3i$

الف) $x^2 - 5x + 4 = 0 \rightarrow (x-3)(x-2) = 0 \rightarrow x = 3, x = 2$

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

الف) $x^2 - 3x - 2 = 0 \rightarrow x = \frac{3 \pm \sqrt{9+8}}{2} \Rightarrow x = \frac{3 \pm \sqrt{17}}{2}, x = \frac{3 - \sqrt{17}}{2}$

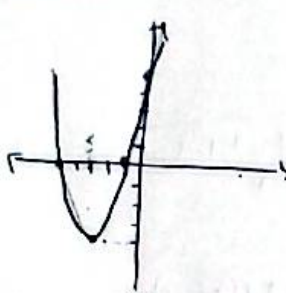
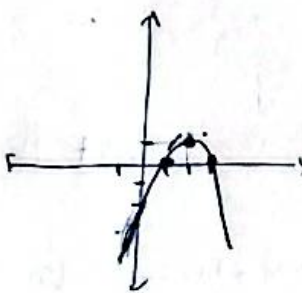
ب) $2x^2 - 4x + \frac{1}{2} = 0 \rightarrow x = \frac{4 \pm \sqrt{16-2}}{4} \Rightarrow x = \frac{4 \pm \sqrt{14}}{4} \Rightarrow x = 1 + \frac{\sqrt{14}}{2}, x = 1 - \frac{\sqrt{14}}{2}$

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

ب) $x^2 + x - 12 = 0 \rightarrow x^2 + x - 12 = 0 \rightarrow (x+4)(x-3) = 0 \rightarrow x = -4, x = 3$

الف) $x^2 - 12x + 27 = 0 \rightarrow x^2 - 12x + 36 = -9 \rightarrow (x-6)^2 = -9 \rightarrow x = 6 \pm 3i$

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

$ا) -3x^2 + 4x - 1 = 0 \rightarrow x = \frac{-4 \pm \sqrt{16-12}}{-6} \rightarrow x = \frac{+4 + \sqrt{4}}{-6}, x = \frac{+4 - \sqrt{4}}{-6}$	
$ب) 2x^2 - x + 2 = 0 \rightarrow \Delta = 1 - 4 < 0$ ریشه ندارد $ج) 2x^2 - 4x + 2 = 0 \rightarrow \Delta = 16 - 16 = 0$ یک ریشه مضرب $د) 2x^2 - x + 1 = 0 \rightarrow \Delta = 1 - 8 < 0$ ریشه ندارد	۶
$2x^2 - 3x + a = 0$ $ا) \Delta > 0 \rightarrow \Delta = 9 - 4a > 0 \rightarrow a < \frac{9}{4}$ $ب) \Delta = 0 \rightarrow \Delta = 9 - 4a = 0 \rightarrow a = \frac{9}{4}$ ریشه مضرب $ج) \Delta < 0 \rightarrow \Delta = 9 - 4a < 0 \rightarrow a > \frac{9}{4}$ فاقد ریشه $د) \Delta \geq 0 \rightarrow a \leq \frac{9}{4}$ ریشه داشته باشد	۷
$y = x^2 + 4x + a$ $\min \begin{cases} \frac{-b}{2a} = -2 \\ \frac{-\Delta}{4a} = -1 \end{cases}$  $x=0 \rightarrow y=a$ $y=0 \rightarrow x=-a, x=-1$	۸
$y = x^2 + 4x - 3$ $\max \begin{cases} \frac{-b}{2a} = 2 \\ \frac{-\Delta}{4a} = 1 \end{cases}$  $x=0 \rightarrow y=-3$ $y=0 \rightarrow x=1, x=3$ $ب) -(x^2 - 4x + 3) = 0$ $-(x-1)(x-3) = 0$ $x=1, x=3$	۹
$x^2 - 3x - 2 = 0$ $ا) S^2 - 2P = 9 + 4 = 13$ $ب) S^3 - 3SP = 27 + 12 = 39$	۱۰