

الف) $x^2 - 4x + 8 = 0$ $x^2 - 4x + 9 = 1$ $(x-3)^2 = 1$ $x-3 = \pm 1$
 $x-3 = 1 \Rightarrow \boxed{x=4}$ $x-3 = -1 \Rightarrow \boxed{x=2}$

ب) $x^2 + 8x + 7 = 0$ $x^2 + 8x + 7 + 9 = 9 \rightarrow (x+4)^2 = 9 \rightarrow x+4 = \pm 3$
 $x+4 = 3 \Rightarrow \boxed{x=-1}$ $x+4 = -3 \Rightarrow \boxed{x=-7}$

الف) $x^2 - 5x + 6 = 0$
 $(x-2)(x-3) = 0 \Rightarrow \boxed{x=2} \quad \boxed{x=3}$

ب) $x^2 - 5x - 14 = 0$
 $(x-7)(x+2) = 0 \Rightarrow \boxed{x=7} \quad \boxed{x=-2}$

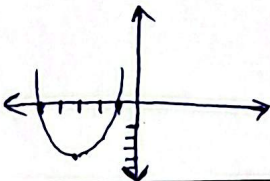
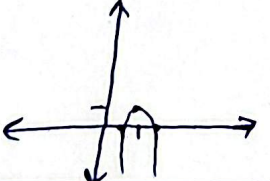
الف) $x^2 - 2x - 5 = 0$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $\frac{2 \pm \sqrt{4 - 4(1)(-5)}}{2} \Rightarrow \frac{2 + \sqrt{24}}{2} \quad \frac{2 - \sqrt{24}}{2}$
 ب) $2x^2 - 4x + \frac{1}{2} = 0$ $\frac{4 \pm \sqrt{16 - 4(2)(\frac{1}{2})}}{4} \Rightarrow \frac{4 + \sqrt{14}}{4} \quad \frac{4 - \sqrt{14}}{4}$

الف) $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0 \Rightarrow \boxed{x=1} \quad \boxed{x=2}$

ب) $4x^2 + x - 3 = 0$
 $x^2 + x - 12 = 0$ $(x+4)(x-3) = 0 \Rightarrow \boxed{x = -\frac{3}{4}} \quad \boxed{x = -1}$

الف) $5x^2 - 12x + 7 = 0$
 $x^2 - 12x + 35 = 0$ $(x-5)(x-7) = 0 \Rightarrow \boxed{x=5} \quad \boxed{x=7} \Rightarrow \boxed{x = \frac{5}{5}} \quad \boxed{x=1}$

ب) $3x^2 - 10x + 7 = 0$
 $x^2 - 10x + 21 = 0 \rightarrow (x-5)(x-3) = 0 \rightarrow \begin{matrix} x=3 \rightarrow \boxed{x=1} \\ x=5 \rightarrow \boxed{x = \frac{5}{3}} \end{matrix}$

الف) $-3x^2 + 10x - 1 = 0$	$\Delta = b^2 - 4ac \rightarrow 100 - 4(-3)(-1) = 113 \Rightarrow$	$\frac{113}{4}$
ب) $2x^2 - x + 2 = 0$	$1 - 4(2)(2) = -15$	ریشه ندارد
ج) $2x^2 - 4x + 2 = 0$	$16 - 4(2)(2) = 0$	1 ریشه دارد
د) $2x^2 - x + 1 = 0$	$1 - 4(2)(1) = -7$	ریشه ندارد
الف) $\Delta > 0 \Rightarrow b^2 - 4ac > 0 \Rightarrow 9 - 16a > 0 \Rightarrow$	$a < \frac{9}{16}$	
ب) $\Delta = 0 \Rightarrow 9 - 16a = 0 \Rightarrow$	$a = \frac{9}{16}$	
ج) $\Delta < 0 \Rightarrow 9 - 16a < 0 \Rightarrow$	$a > \frac{9}{16}$	
د) $\Delta > 0 \Rightarrow$	$a \leq \frac{9}{16}$	
الف) $y = x^2 + 4x + 1$	$(x+1)(x+1) = 0$	$x = -1$ $x = -1$
min $\Rightarrow$ U	$x = \frac{-b}{2a} \Rightarrow \frac{-4}{2} = -2$	در $x = -2$
ext = $\left \frac{-4}{2} \right $		$9 - 16 + 1 = -6$
ب)		
الف) $y = -x^2 + 4x - 3$	max $x = 2$	$\frac{-b}{2a} = \frac{-4}{-2} = 2$
$-4 + 16 - 3 = 9$	$x^2 + 4x + 3 = 0$	$(x+1)(x+3) = 0 \Rightarrow x = -1, -3$
ext = $\left \frac{4}{2} \right $		
ب)		
$x^2 - 3x - 2 = 0$	$\frac{3 \pm \sqrt{9 - 4(1)(-2)}}{2} = \frac{3 \pm \sqrt{17}}{2}$	$\frac{3 + \sqrt{17}}{2} / \frac{3 - \sqrt{17}}{2}$
$S = \frac{3 + \sqrt{17} + 3 - \sqrt{17}}{2} = 3$	$P = \frac{3 + \sqrt{17}}{2} \times \frac{3 - \sqrt{17}}{2} = \frac{9 - 17}{2} = -4$	$\frac{1}{P} = -\frac{1}{4}$
الف) $S^2 - 2P = 9 + 8 = 17$	ب) $S^3 - 3SP = 27 - 3(3)(-4) = 45$	