

الف) $(x-4)(x-2)=0 \Rightarrow x=4 \quad x=2$

ب) $(x+1)(x+5)=0 \Rightarrow x=-1 \quad x=-5$

الف) $(x-2)(x-3)=0 \Rightarrow x=2 \quad x=3$

ب) $(x-5)(x+2)=0 \Rightarrow x=5 \quad x=-2$

الف) $x = \frac{-B \pm \sqrt{B^2 - 4ac}}{2a} \Rightarrow x = \frac{3 \pm \sqrt{9+20}}{2} \Rightarrow \frac{3+\sqrt{29}}{2} = x$
 $x = \frac{3-\sqrt{29}}{2}$

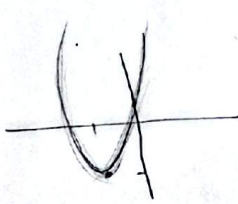
ب) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{5 \pm \sqrt{14-5}}{5} \Rightarrow x = \frac{5+\sqrt{9}}{5} = \frac{5+3}{5} = \frac{8}{5} = \frac{2+\sqrt{3}}{2}$
 $x = \frac{5-\sqrt{9}}{5} = \frac{5-3}{5} = \frac{2}{5} = \frac{2-\sqrt{3}}{2}$

الف) $(x-1)(x-2)=0 \Rightarrow x=1 \quad x=2$

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

الف) $x^2 - 12x + 36 = 0 \Rightarrow (x-6)(x-6) = 0 \Rightarrow x=6 \Rightarrow x = \frac{6}{6} = 1$
 $x=6 \Rightarrow x = \frac{6}{6} = 1$

ب) $x^2 - 10x + 21 = 0 \Rightarrow (x-7)(x-3) = 0 \Rightarrow x=7 \Rightarrow x = \frac{7}{7} = 1$
 $x=3 \Rightarrow x = \frac{3}{3} = 1$

$\text{الف) } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{-5 \pm \sqrt{25 - 12}}{-4} = x = \frac{-5 + \sqrt{13}}{-4}, x = \frac{-5 - \sqrt{13}}{-4}$	۲
$\text{ب) } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{1 \pm \sqrt{1 - 14}}{4} \Rightarrow$ دلتا منفی است بنابراین معادله جوابی در اعداد حقیقی ندارد	۴
$\text{ج) } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{4 \pm \sqrt{14 - 14}}{4}$ دلتا برابر صفر شده پس یک ریشه حقیقی مضاعف دارد	
$\text{د) } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{1 \pm \sqrt{1 - 1}}{4}$ دلتا منفی شده بنابراین معادله جوابی در اعداد حقیقی ندارد	
$x^2 - 3x + a = 0 \Rightarrow a = 3, b = -3, c = a \Rightarrow 9 - 1a$	
$\text{الف) } \Delta > 0 \Rightarrow 9 - 1a > 0 \Rightarrow 1a < 9 \Rightarrow a < \frac{9}{1}$	
$\text{ب) } \Delta = 0 \Rightarrow 9 - 1a = 0 \Rightarrow 1a = 9 \Rightarrow a = \frac{9}{1}$	۷
$\text{ج) } \Delta < 0 \Rightarrow 9 - 1a < 0 \Rightarrow 1a > 9 \Rightarrow a > \frac{9}{1}$	
$\text{د) } \Delta \geq 0 \Rightarrow 9 - 1a \geq 0 \Rightarrow a \leq \frac{9}{1}$	
$x = \frac{-b}{2a} \Rightarrow \frac{-4}{2} = -2$	
$y = x^2 + 4x + 3$	
$\text{ext} = \left \begin{matrix} -2 \\ -4 \end{matrix} \right \quad a > 0 \Rightarrow \min$	الف) ۱
	ب)
$y = -x^2 + 4x - 3 \Rightarrow \max$	
$x = \frac{-b}{2a} \Rightarrow \frac{-4}{-2} = 2 \quad \text{ext} \left \begin{matrix} 2 \\ 1 \end{matrix} \right $	الف) ۹
$y = 1$	
$x = \frac{-b - \sqrt{\Delta}}{2a} \Rightarrow \frac{-1 - \sqrt{14 - 12}}{-2} = \frac{-1 - \sqrt{2}}{-2} = \frac{-1 - \sqrt{2}}{-2} = \frac{-4 - 2}{-2} = \frac{-6}{-2} = 3$	ب)
$x = \frac{-b + \sqrt{\Delta}}{2a} \Rightarrow \frac{-1 + \sqrt{14 - 12}}{-2} = \frac{-1 + \sqrt{2}}{-2} = \frac{-1 + \sqrt{2}}{-2} = \frac{-2 + 2}{-2} = \frac{0}{-2} = 0$	
$x^2 - 3x - 2 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow x = \frac{3 + \sqrt{17}}{2} \quad x = \frac{3 - \sqrt{17}}{2}$	
$S = \frac{3 + \sqrt{17} + 3 - \sqrt{17}}{2} = \frac{6}{2} = 3 \quad P = \frac{3 + \sqrt{17}}{2} \times \frac{3 - \sqrt{17}}{2} = \frac{-11}{4} = -2.75$	
$\text{الف) } 3^2 - 2(-2) = 9 + 4 = 13$	
$\text{ب) } 27 - 3 \times 3(-2) = 27 + 18 = 45$	۱۰