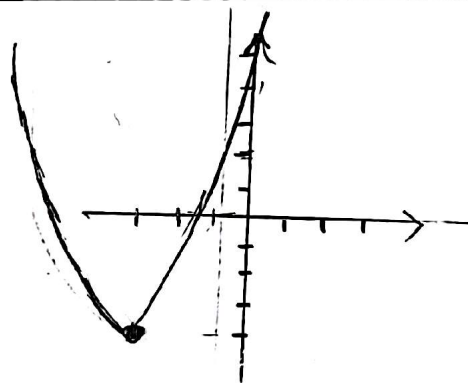




الف)  $-3x^2 + 5x - 1 = 0 \Rightarrow \Delta = b^2 - 4ac = 25 - 12 = 13 \Rightarrow$  ریشه دارد  
 ب)  $2x^2 - x + 2 = 0 \Rightarrow \Delta = b^2 - 4ac = 1 - 16 = -15 \Rightarrow$  ریشه ندارد  
 ج)  $2x^2 - 4x + 2 = 0 \Rightarrow \Delta = b^2 - 4ac = 16 - 16 = 0 \Rightarrow$  یک ریشه مضاعف دارد  
 د)  $2x^2 - x + 1 = 0 \Rightarrow \Delta = b^2 - 4ac = 1 - 8 = -7 \Rightarrow$  ریشه ندارد

الف)  $2x^2 - 2x + a = 0 \Rightarrow \Delta \geq 0 \Rightarrow b^2 - 4ac \geq 0 \Rightarrow 4 - 4a \geq 0$   
 $\rightarrow -4 \geq -4a \rightarrow a \leq 1$   
 ب)  $\Delta = 0 \Rightarrow b^2 - 4ac = 0 \Rightarrow 4 - 4a = 0 \Rightarrow a = 1$   
 ج)  $\Delta < 0 \Rightarrow b^2 - 4ac < 0 \Rightarrow 4 - 4a < 0 \Rightarrow a > 1$   
 د)  $\Delta \geq 0 \Rightarrow 4 - 4a \geq 0 \rightarrow a \leq 1$

$y = x^2 + 9x + a$   
 $\min \left| \frac{-b}{2a} = \frac{-9}{2} = -4.5 \rightarrow \min \left| \frac{-b}{2a} = -4.5 \right|$



$y = -x^2 + 4x - 5$   
 $\max \left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \rightarrow \max \left| \frac{-b}{2a} = 2 \right|$

حسب داده ها و سوال اول و دوم  
 $a + b + c = 0 \Rightarrow x = 1$   
 $\frac{c}{a} = -1$

$x^2 - 3x - 2 = 0$   
 $S = -\frac{b}{a} = 3$   
 $P = \frac{c}{a} = -2$

الف)  $S^2 - 2P = 9 - (-4) = 13$   
 ب)  $S^3 - 3SP = 27 - (-12) = 39$