

الف)  $x^2 - 4x + 4 = 0 \Rightarrow x^2 - 4x + 4 + 1 = 1 \rightarrow (x-2)^2 = 1 \Rightarrow$

$x-2 = 1 \quad \vee \quad x-2 = -1 \rightarrow \boxed{x=3}, \boxed{x=1}$

ب)  $x^2 + 4x + 4 = 0 \Rightarrow x^2 + 4x + 4 + 9 = 9 \rightarrow (x+2)^2 = 9 \Rightarrow$

$x+2 = 3 \quad \vee \quad x+2 = -3 \rightarrow \boxed{x=1}, \boxed{x=-5}$

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

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

الف)  $x^2 - 3x - 4 = 0 \Rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \frac{3 \pm \sqrt{9+16}}{2} = \frac{3 \pm \sqrt{25}}{2}$

ب)  $2x^2 - 4x + \frac{1}{2} = 0 \Rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \frac{4 \pm \sqrt{16-4}}{4} = \frac{4 \pm \sqrt{12}}{4}$

الف)  $x^2 - 3x + 2 = 0 \Rightarrow a+b+c=0 \rightarrow \boxed{x=1}, \boxed{x=2}$

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

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

$\Rightarrow \boxed{x=\frac{7}{5}}, \boxed{x=1}$

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

$\Rightarrow \boxed{x=1}, \boxed{x=\frac{7}{3}}$

الف)  $\frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \frac{-5 \pm \sqrt{25-12}}{-4} = \frac{-5 \pm \sqrt{13}}{-4} \Rightarrow$  ۲ ریشه دارد

ب)  $\parallel \Rightarrow \frac{1 \pm \sqrt{1-16}}{4} \Rightarrow$  داخل رادیکال منفی پس ریشه ندارد.

پ)  $\parallel \Rightarrow \frac{4 \pm \sqrt{16-16}}{4} \Rightarrow$  داخل رادیکال صفر فقط یک ریشه مضاعف

ت)  $\parallel \Rightarrow \frac{1 \pm \sqrt{1-8}}{4} \Rightarrow$  داخل رادیکال منفی پس ریشه ندارد.

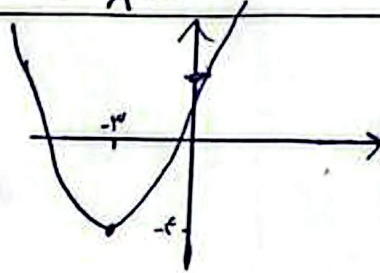
الف)  $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm \sqrt{9-8a}}{4} \Rightarrow (-\infty, 1] = a$

ب)  $\parallel = \frac{3 \pm \sqrt{9-8a}}{4} \Rightarrow a = \frac{9}{8}$

ج)  $\parallel = \parallel \Rightarrow a = (1, +\infty)$

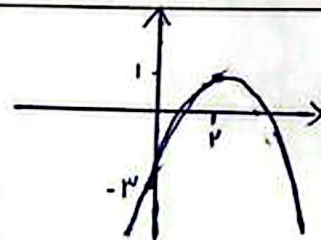
د)  $\parallel = \frac{3 \pm \sqrt{9-8a}}{4} \Rightarrow a = (-\infty, \frac{9}{8}]$

الف)  $\text{Min} \left[ \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4a} \end{array} \right] \Rightarrow \text{Min} \left[ \begin{array}{l} -\frac{3}{4} \\ -1 \end{array} \right]$



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الف)  $\text{Max} \left[ \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4a} \end{array} \right] \Rightarrow \text{Max} \left[ \begin{array}{l} 1 \\ 1 \end{array} \right]$



ب)  $-x^2 + 5x - 3 = 0 \rightarrow$   $\boxed{x=1}$  ,  $\boxed{x=3}$  طل از اینجا

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$x^2 - 3x - 2 = 0 \rightarrow \frac{3 \pm \sqrt{17}}{2}$

$S = 3$

$P = -2$

الف)  $S^2 - 2P = 9 + 4 = \boxed{13}$

ب)  $S^3 - 3SP = 27 + 18 = \boxed{45}$

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