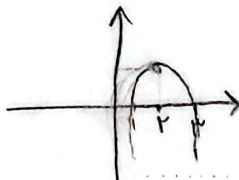


$y = x^2 + 4x + 5$
 $y = (-3)^2 + 4x - 3 + 5$
 $9 + (-12) + 5 = -2$
 $\min: a > 0$

الف) $\text{ext} = \frac{-b}{2a} = \frac{-4}{2} = -2$ و مقصبات: $|-3|$
 ب) 

$y = -x^2 + 4x - 3$
 $y = -x^2 + 4x - 3 = 1$
 $-x^2 + 4x - 3 = 1$
 $\max: a < 0$

الف) $\text{ext} = \frac{-b}{2a} = \frac{-4}{-2} = 2$ مقصبات: $|2|$
 ب) $\frac{c}{a} = \frac{-3}{-1} = 3$ و یک ریشه هاش 

$2x^2 - 3x + a = 0$ $\Delta = (-3)^2 - 4 \times 2 \times a = 9 - 8a$
 الف) $\Delta > 0$ دو ریشه ی متمایز $\frac{9}{8} > a \rightarrow a = 1$
 ب) فاقد ریشه منگاف باشد یعنی در ریشه کلاری $\Delta = b^2 - 4ac = 0$
 ج) معادله فاقد ریشه ی حقیقی باشد $\Delta = b^2 - 4ac < 0$
 د) داشتن ریشه $\Delta = b^2 - 4ac \geq 0$ می توان یک باشد $a \leq \frac{9}{8} = 1,125$

الف) $x^2 - 2x - 1 = 0$
 $x^2 - 2x + 1 + 2 = +2$ $(x-1)^2 = 2$ $\begin{cases} x = 1 + \sqrt{2} \\ x = 1 - \sqrt{2} \end{cases}$
 ب) $x^2 - x - 1 = 0$
 $(x - \frac{1}{2})^2 = 1 + \frac{1}{4} = \frac{5}{4}$
 $x - \frac{1}{2} = \pm \frac{\sqrt{5}}{2}$ $x = \frac{\sqrt{5}}{2} + \frac{1}{2} = \frac{\sqrt{5}+1}{2}$ و ریشه دوم $-x + \frac{1}{2} = \frac{\sqrt{5}}{2}$ $x = \frac{1}{2} - \frac{\sqrt{5}}{2} = \frac{1-\sqrt{5}}{2}$

الف) $x^2 - 2x - 1 = 0$ $\Delta = b^2 - 4ac = 4 - 4 \times (-1) = 8$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$
 $1 + \frac{\sqrt{8}}{2} = 1 + \sqrt{2}$
 $1 - \frac{\sqrt{8}}{2} = 1 - \sqrt{2}$
 ب) $x^2 + x - 4 = 0$ $\Delta = b^2 - 4ac = 1 - 4 \times (-4) = 17$
 $x = \frac{-1 \pm \sqrt{17}}{2} = -\frac{1}{2} \pm \frac{\sqrt{17}}{2}$

$$\text{الف) } x^2 - 11x + 28 = 0$$

$$(x-4)(x-7) = 0 \quad \begin{cases} x=7 \\ x=4 \end{cases}$$

$$\text{ب) } x^2 + 3x - 28 = 0$$

$$(x+7)(x-4) = 0 \quad \begin{cases} x=-7 \\ x=4 \end{cases}$$

$$\text{الف) } 5x^2 - 12x + 7 = 0$$

$$x^2 - 12x + 35 = 0 \quad \begin{cases} x = \frac{12}{5} = 2.4 \\ (x-7)(x-5) = 0 \\ x = \frac{35}{5} = 7 \end{cases}$$

$$\text{ب) } 3x^2 - 10x + 7 = 0$$

$$x^2 - 10x + 21 = 0 \quad \begin{cases} x = \frac{10}{3} = 3.\bar{3} \\ (x-7)(x-3) = 0 \\ x = \frac{21}{3} = 7 \end{cases}$$

$$\text{الف) } 2x^2 - 5x + 3 = 0$$

$$\begin{cases} \frac{c}{a} = \frac{3}{2} = 1.5 \\ a+b+c=0 \end{cases}$$

$$\text{ب) } 4x^2 + 7x + 9 = 0$$

$$\Delta = b^2 - 4ac = 49 - 144 \rightarrow \Delta < 0$$

جواب: لا شيء

$$\text{ب) } 10x^2 + 5x + 3 = 0$$

$$\begin{cases} -\frac{c}{a} = \frac{-3}{10} = -0.3 \\ a+b+c=0 \end{cases}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0$$

$$\Delta = b^2 - 4ac = 25 - 4 = 21$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{21}}{4}$$

$$x^2 - 3x - 2 = 0$$

جميع الجذور هي سالبة $\rightarrow \frac{c}{a}$
 مجموع الجذور هو سالب $\rightarrow \frac{-b}{a}$

$$\text{الف) } s^2 - 2p = 3^2 - 2 \times (-2) = 9 - (-4) = 13$$

$$\text{ب) } s^3 - 3sp = 3^3 - 3 \times (-2) \times (-2) = 27 - 12 = 15$$

$$\text{الف) } \binom{5}{0} + \binom{9}{2} = \frac{5 \times 4}{2 \times 1} + \frac{9 \times 8}{2} = 10 + 36 = 46$$

معامل $\binom{5}{2}$

$$\text{ب) } \binom{9}{3} - \binom{1}{2} = \frac{9 \times 8 \times 7}{3!} - \frac{1 \times 1 \times 1}{1!} = \frac{9 \times 8 \times 7}{6} - 1 = 84 - 1 = 83$$