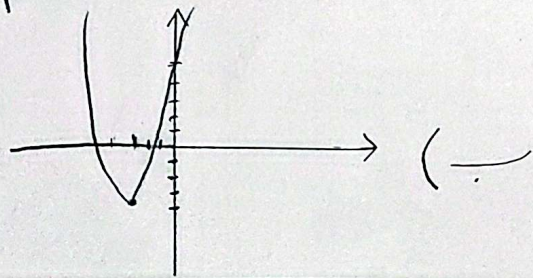


$$\text{ext} \left| \begin{aligned} -\frac{b}{2a} &= -\frac{4}{2} = -2 \\ -\frac{\Delta}{4a} &= -\frac{b^2 - 4ac}{4} = -\frac{16 - 20}{4} = -\frac{14}{4} = -\frac{7}{2} \end{aligned} \right.$$

الف) min -

$$y = x^2 + 4x + 5$$

$$ax^2 + bx + c$$



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$$y = -x^2 + 4x - 3$$

$$ax^2 + bx + c$$

$$\text{ext} \left| \begin{aligned} -\frac{b}{2a} &= -\frac{4}{-2} = 2 \\ -\frac{\Delta}{4a} &= -\frac{b^2 - 4ac}{4} = -\frac{16 - 12}{-4} = \frac{4}{-4} = -1 \end{aligned} \right.$$

الف) max

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(-) نقاطی که منحنی محور را قطع می کند همان ریشه ها هستند. -3 و -1
 $y = -x^2 + 4x - 3 \rightarrow a + c = b \rightarrow -3 + (-1) = -4$
 $-3 = -\frac{c}{a} = -\frac{-3}{1} = 3$

اگر $\Delta > 0$ دو ریشه حقیقی متمایز $\Delta = 0$ یک ریشه حقیقی مضاعف (دو ریشه یکسان) $\Delta < 0$ دو ریشه غیر حقیقی

الف) $\Delta > 0$ $x^2 - 3x + a = 0$ $\Delta = 9 - 4a = 9 - 12 = -3$ $\Delta < 0$

ب) $\Delta = 0$ $a = \frac{9}{4}$ $\Delta = 9 - 4a = 9 - 9 = 0$

ج) $\Delta < 0$ $a = 2$ $\Delta = 9 - 4a = 9 - 8 = 1$

د) $\Delta \geq 0$ $a = \{ \frac{9}{4}, 1 \}$

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الف) $x^2 - 2x - 1 = 0 \Rightarrow x^2 - 2x - 1 + 2 = +2 = x^2 - 2x + 1 = +2$
 $(x-1)^2 = +2 \Rightarrow x-1 = \pm \sqrt{2} \rightarrow x-1 = +\sqrt{2} \rightarrow x = 1+\sqrt{2}$
 $x-1 = -\sqrt{2} \rightarrow x = 1-\sqrt{2}$

ب) $x^2 - x - 1 = 0 \Rightarrow$

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الف) $x^2 - 2x - 1 = 0 \Rightarrow \Delta = 4 + 4 = 8$ $\Delta > 0$

ب) $x^2 + x - 3 = 0 \Rightarrow \Delta = 1 + 12 = 13$ $\Delta > 0$

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$$\text{الف) } x^2 - 11x + 28 = 0 \Rightarrow (x-7)(x-4) = 0 \begin{cases} \rightarrow +7 \\ \rightarrow +4 \end{cases}$$

$$\text{ب) } x^2 + 3x - 28 = 0 \Rightarrow (x+7)(x-4) = 0 \begin{cases} \rightarrow -7 \\ \rightarrow +4 \end{cases}$$

$$\text{الف) } \Delta x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + 3\Delta = 0$$

$$(x-\Delta)(x-7) = 0 \begin{cases} \rightarrow \frac{+\Delta}{\Delta} = 1 \\ \rightarrow \frac{+7}{\Delta} \end{cases}$$

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

$$(x-3)(x-7) = 0 \begin{cases} \rightarrow \frac{+3}{3} = 1 \\ \rightarrow \frac{+7}{3} \end{cases}$$

$$\text{الف) } 2x^2 - 5x + 3 = 0 \quad \text{ب) } 2x^2 - 5x + 1 = 0 \quad \Delta = \frac{25 - 4}{4} = \frac{21}{4}$$

$$\begin{cases} \rightarrow 1 \\ \rightarrow \frac{c}{a} = \frac{3}{2} \end{cases}$$

$$a+b+c=0$$

$$\frac{5 - \sqrt{\frac{21}{4}}}{2} \text{ و } \frac{5 + \sqrt{\frac{21}{4}}}{2}$$

$$\text{ب) } 2x^2 + 5x + 3 = 0$$

$$\begin{cases} \rightarrow -1 \\ \rightarrow -\frac{c}{a} = -\frac{3}{2} \end{cases}$$

$$\Delta = \frac{25 - 12}{4} = \frac{13}{4} \rightarrow \Delta < 0$$

$$\Delta = \frac{25 - 12}{4} \rightarrow \Delta < 0$$

لا يوجد حقيقي

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

$$S = -3$$

$$P = 2$$

$$\text{الف) } S^2 - 2P = 14 - 12 = 2$$

$$\text{ب) } S^3 - 3SP = -27 - 6(2) = -27 - 12 = -39$$

$$\text{الف) } \binom{7}{5} + \binom{9}{2} = \frac{7!}{2! \times 5!} + \frac{9!}{2! \times 7!} = \frac{7 \times 6 \times 5}{2 \times 5!} + \frac{9 \times 8 \times 7}{2 \times 7!} = 21 + 36 = 57$$

$$\text{ب) } \binom{9}{3} - \binom{7}{2} = \frac{9!}{3! \times 6!} - \frac{7!}{2! \times 5!} = \frac{9 \times 8 \times 7}{3 \times 2 \times 5!} - \frac{7 \times 6}{2 \times 5!} = 84 - 21 = 63$$