الف) $x^2 - 11x + 28 = 0 \quad (x-7)(x-4) = 0 \Rightarrow \begin{cases} x_1 = 7 \\ x_2 = 4 \end{cases}$

ب) $x^2 + 3x + 28 = 0 \quad (x-4)(x+7) = 0 \Rightarrow \begin{cases} x_1 = 4 \\ x_2 = -7 \end{cases}$

۶ (۲)

الف) $5x^2 - 17x + 7 = 0 \quad x^2 - 17x + 7 \times 5 = x^2 - 17x + 35$

$(x-5)(x-7) = 0 \Rightarrow \begin{cases} x_1 = \frac{5}{5} = 1 \\ x_2 = \frac{7}{5} = 1,4 \end{cases}$

۷ (۲)

ب) $3x^2 - 10x + 7 = 0 \quad \cdot\cdot \quad x^2 - 10x + 21 = 0$

$(x-3)(x-7) = 0 \Rightarrow \begin{cases} x_1 = \frac{3}{3} = 1 \\ x_2 = \frac{7}{3} = 2\frac{1}{3} \end{cases}$

الف) $2x^2 - 5x + 3 = 0 \quad a+b+c=0 \Rightarrow x = \begin{cases} 1 \\ \frac{c}{a} = \frac{3}{2} = 1,5 \end{cases}$

ب) $2x^2 + 5x + 3 = 0 \quad a+c=b \Rightarrow x = \begin{cases} -1 \\ -\frac{c}{a} = -\frac{3}{2} = -1,5 \end{cases}$

۸ (۲)

ج) $2x^2 - 5x + 1 = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{2 \cdot 5 - 4 \times 1 \times 2}}{4} = \frac{5 \pm \sqrt{17}}{4} \Rightarrow x = \begin{cases} \frac{5+\sqrt{17}}{4} \\ \frac{5-\sqrt{17}}{4} \end{cases}$

د) $4x^2 + 7x + 9 = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-7 \pm \sqrt{49 - 4 \times 4 \times 9}}{8} \rightarrow \Delta < 0 \Rightarrow$ پس ندارد

$x^2 - 3x - 2 = 0 \quad S = \frac{-b}{a} = \frac{-(-3)}{1} = 3 \quad P = \frac{c}{a} = \frac{-2}{1} = -2$

۹ (۲)

الف) $S^2 - 2P = 3^2 - 2(-2) = 13$

ب) $S^3 - 3SP = 3^3 - 3 \times 3 \times (-2) = 45$

۱۰ (۲)

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

ب) $\binom{9}{3} + \binom{8}{2} = \frac{9!}{6! \times 3!} - \frac{8!}{6! \times 2!} = 84 - 28 = 56$

۲۵

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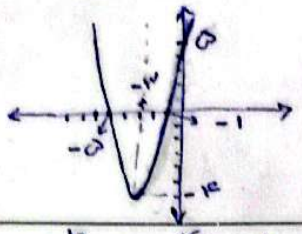
۱ الف) نوع Min = ext

$\text{Min} \left| \frac{-b}{2a} = \frac{-6}{2} = -3 \right.$

عرض رأس $= x^2 + 6x + 5 = (-3)^2 + 6(-3) + 5 = 9 - 18 + 5 = -4$

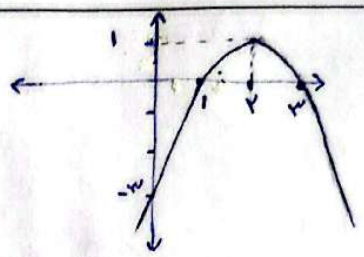


ب) $a + c = b \Rightarrow \begin{cases} x = -1 \\ x = \frac{-c}{a} = \frac{-a}{1} = -a \end{cases}$

۲ الف)

$\text{Max} \left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right.$

عرض رأس $= -x^2 + 4x - 3 = -4 + 8 - 3 = 1$



ب) $a + c + b = -1 + 4 - 3 = 0 \Rightarrow \begin{cases} x = 1 \\ x = \frac{c}{a} = \frac{-3}{-1} = 3 \end{cases}$

۳ الف) $\Delta > 0 \Rightarrow b^2 - 4ac = 9 - 4 \times 2 \times a > 0 \Rightarrow 9 > 8c \Rightarrow \frac{9}{8} > a \; , \; a \in R$

ب) $\Delta = 0 \Rightarrow b^2 - 4ac = 9 - 8a = 0 \Rightarrow 9 = 8a \Rightarrow a = \frac{9}{8} \; ; \; a \in R$

ج) $\Delta < 0 \Rightarrow b^2 - 4ac = 9 - 8a < 0 \Rightarrow 9 < 8a \Rightarrow a > \frac{9}{8} \; , \; a \in R$

د) $\Delta \geq 0 \Rightarrow b^2 - 4ac = 9 - 8a \geq 0 \Rightarrow 9 \geq 8a \Rightarrow \frac{9}{8} \geq a \; , \; a \in R$

۴ الف) $x^2 - 2x - 1 = 0 \quad x^2 - 2x - 1 + 2 = 2 \quad (x-1)^2 = 2$

$\sqrt{(x-1)^2} = \pm\sqrt{2} \Rightarrow x - 1 = \pm\sqrt{2} \Rightarrow \begin{cases} x_1 = 1 + \sqrt{2} \\ x_2 = 1 - \sqrt{2} \end{cases}$

ب) $x^2 - x - 1 = 0 \quad x^2 - x - 1 + \frac{a}{4} = x^2 - x + \frac{1}{4} = \frac{a}{4}$

$(x - \frac{1}{2})^2 = \frac{a}{4} \quad \sqrt{(x - \frac{1}{2})^2} = \pm\frac{\sqrt{a}}{2} \Rightarrow x - \frac{1}{2} = \pm\frac{\sqrt{a}}{2} \Rightarrow \begin{cases} x_1 = \frac{1 + \sqrt{a}}{2} \\ x_2 = \frac{1 - \sqrt{a}}{2} \end{cases}$

۵ الف) $x^2 - 2x - 1 = 0 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{2 \pm \sqrt{4 - 4 \times 1 \times (-1)}}{2}$

$\frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2} \Rightarrow \begin{cases} x_1 = 1 + \sqrt{2} \\ x_2 = 1 - \sqrt{2} \end{cases}$

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

$= \frac{-1 \pm \sqrt{17}}{2} \Rightarrow \begin{cases} x_1 = \frac{-1 + \sqrt{17}}{2} \\ x_2 = \frac{-1 - \sqrt{17}}{2} \end{cases}$