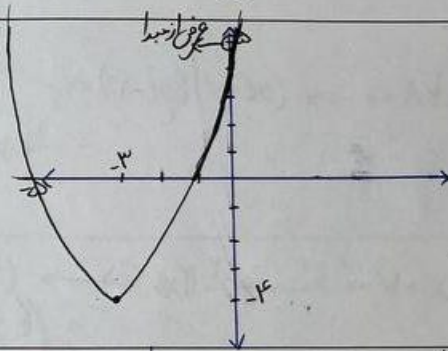
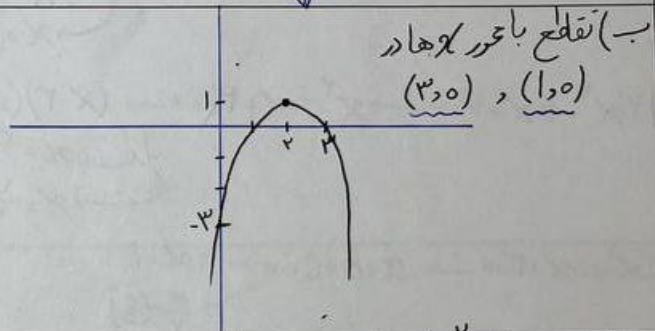


$$\begin{aligned} \rightarrow a > 0 \\ \text{Min} \quad \frac{-b}{2a} \rightarrow \frac{-4}{2 \times 1} = -2 \rightarrow \text{ext} \begin{vmatrix} -3 \\ -4 \end{vmatrix} \\ y = (-3)^2 + (4 \times -3) + 5 = -4 \end{aligned}$$



$$\begin{aligned} ax^2 + bx + c = 0 \\ \hookrightarrow a = 1 \quad c = 5 \\ b = 4 \end{aligned}$$

$$\begin{aligned} \rightarrow a < 0 \\ \text{Max} \quad \frac{-b}{2a} = \frac{-4}{2 \times -1} = 2 \rightarrow \text{ext} \begin{vmatrix} 2 \\ 1 \end{vmatrix} \\ (-2)^2 + (4 \times 2) - 3 = 1 \end{aligned}$$



$$\begin{aligned} a = -1 \\ b = 4 \\ c = -3 \end{aligned}$$

$$\Delta = b^2 - 4ac = (-4)^2 - 4(1 \times 5) = 16 - 20 = -4 \quad a = 2, b = 3, c = a \quad \text{معادله: } 2x^2 - 3x + a = 0$$

$$9 - 1a > 0 \rightarrow 1a < 9 \Rightarrow a < \frac{9}{1} \quad \text{الف)}$$

$$9 - 1a = 0 \rightarrow a = \frac{9}{1} \quad \text{ب)}$$

$$9 - 1a < 0 \rightarrow a < \frac{9}{1} \quad \text{ج)}$$

$$9 - 1a \geq 0 \Rightarrow a \leq \frac{9}{1} \quad \text{د)}$$

$$\text{الف)} \quad x^2 - 2x - 1 = 0 \rightarrow x^2 - x = 1 \xrightarrow{+1} x^2 - x + 1 = \frac{1+1}{1} \Rightarrow x - 1 = \pm \sqrt{2} \\ x = 1 \pm \sqrt{2}$$

$$\left(\frac{1}{x}\right)^2 = \frac{1}{x} \quad \leftarrow \text{معكوف ضرب}$$

$$\text{ب)} \quad x^2 - x - 1 = 0 \rightarrow x^2 - x = 1 \xrightarrow{+\frac{1}{4}} x^2 - x + \frac{1}{4} = \frac{5}{4} \rightarrow \left(x - \frac{1}{2}\right)^2 = \frac{5}{4} \rightarrow x - \frac{1}{2} = \pm \sqrt{\frac{5}{4}} = \pm \frac{\sqrt{5}}{2} \\ x = \frac{1}{2} \pm \frac{\sqrt{5}}{2}$$

$$\text{الف)} \quad x^2 - 2x - 1 = 0 \rightarrow \Delta = (-2)^2 - (4 \times 1 \times (-1)) = 12 \xrightarrow{\text{ریشه ها}} x = \frac{-(-2) \pm \sqrt{12}}{2 \times 1} = \frac{2 \pm \sqrt{12}}{2} \Rightarrow x(1 \pm \sqrt{3}) = 1 \pm \sqrt{3}$$

$$\begin{aligned} a = 1 \\ b = -2 \\ c = -1 \end{aligned}$$

$$\text{ب)} \quad x^2 + x - 4 = 0 \rightarrow \Delta = 1^2 - (4 \times 1 \times (-4)) = 1 + 16 = 17$$

$$\begin{aligned} a = 1 \\ b = 1 \\ c = -4 \end{aligned} \quad x = \frac{-1 \pm \sqrt{17}}{2}$$

الف) $x^2 - 11x + 28 = 0 \rightarrow (x-4)(x-7) = 0 \rightarrow \begin{cases} x=4 \\ x=7 \end{cases}$
 $a=1$
 $b=-11$
 $c=28$

ب) $x^2 + 3x - 28 = 0 \rightarrow (x+7)(x-4) = 0 \rightarrow \begin{cases} x=-7 \\ x=4 \end{cases}$
 $a=1$
 $b=3$
 $c=-28$

الف) $\omega x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 7\omega = 0 \rightarrow (x-\omega)(x-7) = 0$
 $\rightarrow \begin{cases} x=\omega \\ x=7 \end{cases}$

ب) $3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x-3)(x-7) = 0$
 $\rightarrow \begin{cases} x=3 \\ x=7 \end{cases}$

الف) $2x^2 - \omega x + 3 = 0 \rightarrow a+b+c=0 \rightarrow \begin{cases} x=1 \\ x=\frac{3}{\omega} = \frac{c}{a} \end{cases}$

ب) $2x^2 + \omega x + 3 = 0 \rightarrow a+c=b \rightarrow \begin{cases} x=-1 \\ x=\frac{-c}{a} = \frac{-3}{\omega} \end{cases}$

ج) $2x^2 - \omega x + 1 = 0$
 $\Delta = b^2 - 4ac \rightarrow (-\omega)^2 - (4 \times 2 \times 1) = 1\omega \rightarrow x = \frac{\omega \pm \sqrt{1\omega}}{4}$

د) $4x^2 + 7x + 9 = 0$
 $\Delta = 7^2 - (4 \times 4 \times 9) = 49 - 144 = -9\omega \Rightarrow \Delta < 0 \rightarrow$ *ریشه حقیقی ندارد*

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

$a=1$

$b=-3$

$c=-2$

$S = \frac{-b}{a} = \frac{-(-3)}{1} = 3$

$P = \frac{c}{a} = \frac{-2}{1} = -2$

الف) $S^2 - 2P \rightarrow (3)^2 - 2(-2) = 9 + 4 = 13$

ب) $S^3 - 3SP \rightarrow 3^3 - (3 \times 3 \times (-2)) = 27 + 18 = 45$

الف) $\binom{7}{\omega} + \binom{9}{\gamma} \rightarrow$
 $\rightarrow \frac{7 \times 6}{2 \times 1} = 21 \rightarrow \frac{9 \times 8}{2 \times 1} = 36 \rightarrow \begin{cases} 21 + 36 = 57 \\ 21 + 36 = 57 \end{cases}$

ب) $\binom{9}{\gamma} - \binom{1}{\gamma} \rightarrow$
 $\rightarrow \frac{9 \times 8 \times 7}{3 \times 2 \times 1} = 84 \rightarrow \frac{1 \times 0}{1 \times 1} = 0 \rightarrow \begin{cases} 84 - 0 = 84 \\ 84 - 0 = 84 \end{cases}$

$\binom{n}{m} = \frac{n!}{m!(n-m)!} = \frac{n(n-1)}{m!}$

