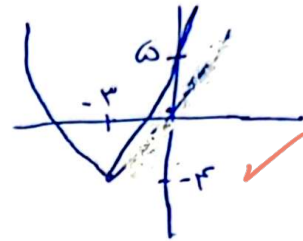


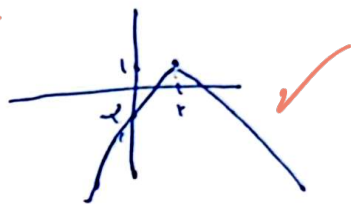
$y = a^2 + 4a + 9$ $\min$ $\left| \frac{-b}{2a} = \frac{-4}{2} = -2 \right|$

$y = 9 + (-2)^2 = 5$



$y = -a^2 + 4a - 3$ $\max$ $\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right|$

$y = -4 + 4 - 3 = -3$



$0 = -a^2 + 4a - 3 \Rightarrow 3 = -a^2 + 4a \Rightarrow a = 1$

$2a^2 - 4a + 1 = 0$

$b^2 - 4ac > 0 \Rightarrow 16 - 4 > 0 \Rightarrow \Delta > 0$

$b^2 - 4ac = 0 \Rightarrow 16 - 4 = 0 \Rightarrow \Delta = 0$

$b^2 - 4ac < 0 \Rightarrow 16 - 4 < 0 \Rightarrow \Delta < 0$

$b^2 - 4ac \geq 0 \Rightarrow 16 - 4 \geq 0 \Rightarrow \Delta \geq 0$

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

$a^2 - a - 1 = 0 \Rightarrow a^2 - 2a + 1 = -a + 2 \Rightarrow (a-1)^2 = -a + 2$

$a^2 + 2a + 1 = 2a + 2 \Rightarrow a^2 - 1 = 0 \Rightarrow (a+1)(a-1) = 0 \Rightarrow a = -1$

$a^2 - 2a - 1 = 0 \quad \Delta = 4 - (-4) = 8 \quad a = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$

$a^2 + a - 4 = 0 \quad \Delta = 1 - (-16) = 17 \quad a = \frac{-1 \pm \sqrt{17}}{2}$

$$\text{الف) } m^2 - 11m + 1 = 0 \quad (m-4)(m-1) = 0 \Rightarrow m = 4$$

$$\text{ب) } \cancel{m^2 - 11m + 1 = 0}$$

$$m^2 + 3m - 2 = 0 \quad (m+2)(m-1) = 0 \Rightarrow m = -2$$

$$\text{الف) } \omega m^2 - 12m + 1 = 0 \Rightarrow \omega m^2 - 12m + 3\omega = 0 \Rightarrow (m-3)(m-\omega) = 0 \Rightarrow m = \frac{3}{\omega}$$

$$m = \frac{3}{\omega} = 1$$

$$\text{ب) } 3m^2 - 10m + 1 = 0 \Rightarrow m^2 - 10m + 1 = 0 \Rightarrow (m-3)(m-1) = 0 \Rightarrow m = 3$$

$$m = \frac{3}{1} = 3$$

$$\text{الف) } 2m^2 - \omega m + 3 = 0 \quad a+b+c=0 \Rightarrow m=1$$

$$2\omega + 3 = 0 \quad m = \frac{c}{a} = \frac{3}{\omega}$$

$$\text{ب) } 2m^2 + \omega m + 3 = 0$$

$$a+c=b \Rightarrow m = -1$$

$$2, 3 = \omega$$

$$\text{ج) } 2m^2 - \omega m + 1 = 0$$

$$\Delta = 4\omega - 4 = 0$$

$$m = \frac{\omega \pm \sqrt{1\omega}}{2} = \frac{\omega \pm \frac{1}{2}\sqrt{1\omega}}{2}$$

$$\text{د) } 4m^2 + 10m + 9 = 0 \quad \Delta = 100 - 144 = -44$$

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$$m^2 - 3m - 2 = 0$$

$$s = \frac{-b}{a} = \frac{3}{1} = 3$$

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

$$\text{الف) } s^2 - 3s - 4 = 13$$

$$\text{ب) } s^2 - 3s - 4 = 13$$

$$\text{الف) } \begin{pmatrix} u \\ v \end{pmatrix} + \begin{pmatrix} q \\ r \end{pmatrix} = \frac{u!}{\omega! \times v!} + \frac{q!}{v! \times r!} = 21 + 34 = 55$$

$$\text{ب) } \begin{pmatrix} q \\ r \end{pmatrix} + \begin{pmatrix} u \\ v \end{pmatrix} = \frac{q!}{r! \times u!} + \frac{u!}{v! \times r!} = 14 + 21 = 35$$