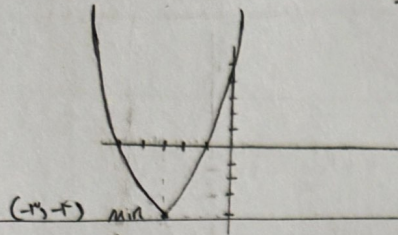
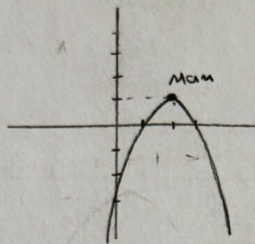


$\alpha = 1$
 $y = x^2 + 4x + 5$
 $\text{ext } (M_m) = \left| \begin{array}{c} -\frac{b}{2a} = \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} = \frac{-16}{4} = -4 \end{array} \right| \Rightarrow \text{Min} = \left| \begin{array}{c} -3 \\ -4 \end{array} \right|$
 $a > 0 \Rightarrow \leftarrow$
 (U)
 $\Delta = b^2 - 4ac = 16 - 20 = -4 \Rightarrow \frac{-16}{4} = -4$
 $9 - 16 + 5 = -2 \quad (x = -2) \Rightarrow y = -2$



$y = x^2 + 4x + 5$
 $y = 0$
 $0 = x^2 + 4x + 5 \quad (x+1)(x+5) = 0 \Rightarrow \begin{cases} x = -1 \\ x = -5 \end{cases}$

$\text{ext} = \left| \begin{array}{c} -\frac{b}{2a} \\ \frac{-\Delta}{4a} \end{array} \right| \Rightarrow \alpha < 0 \Rightarrow \text{Max}(\cap) \Rightarrow \text{Max} = \left| \begin{array}{c} -\frac{f}{-2} = +2 \\ -\frac{f}{-4} = +1 \end{array} \right|$



$y = -x^2 + 4x - 3$
 $\Delta = 16 - 4(1)(3) = 16 - 12 = 4$
 $-x^2 + 4x - 3 = 0 \Rightarrow x^2 - 4x + 3 = 0 \Rightarrow (x-1)(x-3) = 0 \Rightarrow \begin{cases} x = 1 \\ x = 3 \end{cases}$

$2x^2 - 3x + a = 0$
 $\Delta > 0 \Rightarrow \Delta = b^2 - 4ac = 9 - 4(2)a = 9 - 8a > 0$
 $9 - 8a > 0 \Rightarrow -8a > -9 \Rightarrow a < \frac{9}{8}$

$9 - 8a = 0 \Rightarrow 8a = 9 \Rightarrow a = \frac{9}{8}$

$a > \frac{9}{8} \Rightarrow \Delta < 0$

$a < \frac{9}{8} \Rightarrow \Delta > 0$

$x^2 - 2x - 1 = 0 \Rightarrow x^2 - 2x + 1 = +2 \Rightarrow (x-1)^2 = +2$
 $\begin{cases} x-1 = +\sqrt{2} \rightarrow x = \sqrt{2} + 1 \\ x-1 = -\sqrt{2} \rightarrow x = 1 - \sqrt{2} \end{cases}$

$x^2 - x - 1 = 0 \Rightarrow (x - \frac{1}{2})^2 = \frac{5}{4} \Rightarrow \begin{cases} x - \frac{1}{2} = +\frac{\sqrt{5}}{2} \Rightarrow x = \frac{\sqrt{5} + 1}{2} \\ x - \frac{1}{2} = -\frac{\sqrt{5}}{2} \Rightarrow x = \frac{1 - \sqrt{5}}{2} \end{cases}$
 $(x^2 - x + \frac{1}{4}) = (x - \frac{1}{2})^2$

$x^2 - 2x - 1 = 0$
 $\Delta = b^2 - 4ac = 4 - 4(-1) = +8$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2}$

$x^2 + x - 4 = 0$

$\Delta = b^2 - 4ac = 1 - 4(-4) = 1 + 16 = 17$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{17}}{2}$

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

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

$$ج) \omega x^2 - 12x + 4 = 0 \rightsquigarrow x^2 - 12x + 3\omega = 0 \xrightarrow{\text{مشتق}} (x-3)(x-\omega) = 0 \Rightarrow \begin{cases} x = \frac{+3}{\omega} \\ x = \frac{+3}{\omega} = +1 \end{cases}$$

$$ب) 3x^2 - 10x + 4 = 0 \rightsquigarrow x^2 - 10x + 12 = 0 \xrightarrow{\text{مشتق}} (x-3)(x-4) = 0 \Rightarrow \begin{cases} x = \frac{3}{4} = +1 \\ x = \frac{4}{3} \end{cases}$$

$$ج) 2x^2 - 5x + 2 = 0 \quad a+b+c=0 \rightsquigarrow \begin{cases} x=+1 \\ x = \frac{c}{a} = \frac{2}{2} \end{cases}$$

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

$$ج) 2x^2 - 5x + 1 = 0 \quad \Delta = b^2 - 4ac = 25 - 4 \times 2 = 25 - 8 = 17$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \begin{cases} \frac{5 + \sqrt{17}}{4} = x \\ \frac{5 - \sqrt{17}}{4} = x \end{cases}$$

$$د) 2x^2 + 7x + 3 = 0$$

$$\Delta = b^2 - 4ac = 49 - (4 \times 7 \times 3) = 49 - 84 = -35 \Rightarrow \Delta < 0 \rightsquigarrow \text{لا يوجد حلول حقيقية (مركبة)}.$$

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

$$ج) S^2 - 3P = 4 - 3(-2) = 4 + 6 = +10$$

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

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

$$ب) S^2 - 3SP = 25 - 3(+3)(-2) = 25 + 18 = 43$$

$$\text{انتخاب} = \binom{n}{k} = \frac{n!}{k! \times (n-k)!}$$

$$ج) \binom{5}{\omega} + \binom{4}{r} = \frac{5!}{\omega! \times 2!} + \frac{4!}{r! \times 1!} = \frac{5 \times 4 \times 3}{2 \times 1} + \frac{4 \times 3}{1 \times 1} = 15 + 12 = 27$$

$$ب) \binom{4}{r} - \binom{1}{r} = \frac{4!}{r! \times 4!} - \frac{1!}{r! \times 4!} = \frac{4 \times 3 \times 2}{4 \times 3 \times 2} - \frac{1 \times 1 \times 1}{4 \times 3 \times 2} = 1 - \frac{1}{24} = \frac{23}{24}$$