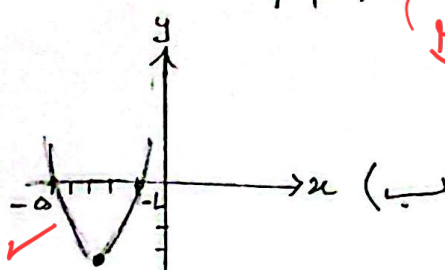
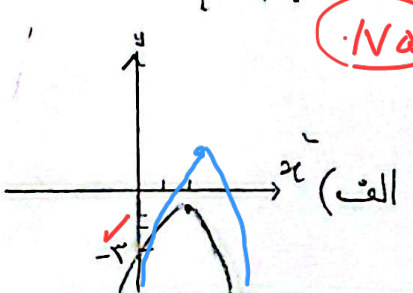


الف) $\begin{bmatrix} -3 \\ 4 \end{bmatrix}$ (ب) 

ب) $\min_x \begin{cases} \frac{-b}{2a} \Rightarrow \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} \Rightarrow \frac{b^2 - 4ac}{4a} = \frac{16 - 4(1)(5)}{4} = \frac{16}{4} = 4 \end{cases}$

الف) $\begin{bmatrix} 1 \\ -1 \end{bmatrix}$ (ب) 

ب) این فضا بر محورهای x و y با محورهای x و y $-x^2 + 4x - 3 \rightarrow x=1$ و $x=3$

الف) $\begin{cases} \frac{-b}{2a} \Rightarrow \frac{-4}{2(-1)} = \frac{-4}{-2} = 2 \\ \frac{-\Delta}{4a} \Rightarrow \frac{b^2 - 4ac}{4a} = \frac{16 - 4(-1)(-3)}{4(-1)} = \frac{16 - 12}{-4} = \frac{4}{-4} = -1 \end{cases}$

الف) $\begin{bmatrix} 1 \\ 5 \end{bmatrix}$ (ب) $\Delta > 0 \Rightarrow$ معادله دارای دو ریشه متمایز است

ب) $a = \frac{9}{\lambda} \Rightarrow \Delta = 9 - 4(2)(\frac{9}{\lambda}) = 0 \rightarrow \Delta = 0 \Rightarrow$ معادله دارای یک ریشه مضاعف است

ج) $a = 5 \Rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 9 - 4(2)(5) = 9 - 20 = -11 \Delta < 0 \Rightarrow$ معادله ندارد

د) $a = 1 \rightarrow$ جمع ریشه ها $= 2 - 3 + 1 = 0 \Rightarrow x = \frac{1}{a} \rightarrow \frac{1}{1} = 1$

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

ب) $x^2 - x - 1 = 0 \xrightarrow{+\frac{1}{x}}$ $x^2 - x + \frac{1}{x} = \frac{1}{x} + 1 \rightarrow x = \frac{1}{x} \pm \frac{\sqrt{5}}{2} \rightarrow x = \frac{1 \pm \sqrt{5}}{2}$

الف) $x^2 - 1x - 1 = 0 \rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 1 - 4(1)(-1) = 5$

ب) $x^2 + x - 4 = 0 \rightarrow \Delta = 1 - 4(1)(-4) = 17$

الف) $x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \frac{-(-2) \pm \sqrt{17}}{2} = \frac{2 \pm \sqrt{17}}{2} \Rightarrow x = \frac{2 + \sqrt{17}}{2} = 1 + \frac{\sqrt{17}}{2}$ و $x = \frac{2 - \sqrt{17}}{2} = 1 - \frac{\sqrt{17}}{2}$

الف) $x^2 - 11x + 18 \Rightarrow (x-7)(x-4) = 0 \rightarrow x-7=0 \Rightarrow x=7$ ✓
 $\rightarrow x-4=0 \Rightarrow x=4$

(2)

ب) $x^2 + 3x - 28 \Rightarrow (x+7)(x-4) = 0 \rightarrow x+7=0 \Rightarrow x=-7$ ✓
 $\rightarrow x-4=0 \Rightarrow x=4$

الف) $5x^2 - 12x + 7 = 0 \rightsquigarrow x^2 - 12x + 35 = 0$ $\xrightarrow{\text{المميز}}$ $(x-7)(x-5) = 0$ ✓
 $\rightarrow x-7=0 \rightarrow x=7$
 $\rightarrow x-5=0 \rightarrow x=5$

(2)

ب) $3x^2 - 10x + 7 = 0 \rightsquigarrow x^2 - 10x + 21 = 0$ $\xrightarrow{\text{المميز}}$ $(x-7)(x-3) = 0$ ✓
 $\rightarrow x-7=0 \rightarrow x=7$
 $\rightarrow x-3=0 \rightarrow x=3$

الف) $2x^2 - 5x + 2 = 0 \Rightarrow x^2 - 5x + 4 = 0 \rightarrow (x-2)(x-3) = 0 \rightarrow x-2=0 \rightarrow x=2$ ✓
 $\rightarrow x-3=0 \rightarrow x=3$

ب) $2x^2 + 5x + 3 = 0 \rightarrow a+c=b \Rightarrow x=-1 / x = -\frac{c}{a} = -\frac{3}{2}$

(1/2)

ج) $2x^2 - 5x + 1 = 0 \rightarrow \Delta = b^2 - 4ac = 25 - 4(2)(1) = 17$ ✓
 $\Delta = 25 - 4(2)(1) = 17$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{17}}{4} \rightarrow x = \frac{5 + \sqrt{17}}{4}$
 $\rightarrow x = \frac{5 - \sqrt{17}}{4}$
 دلتا عبارت منفی است در نتیجه ندارد
 > $4x^2 + 7x + 9 = 0 \rightarrow x(4x+9) = 0 \rightarrow x=0 / 4x+9=0 \rightarrow x=-\frac{9}{4}$

الف) $s^2 - 2p = (1 - \frac{1}{2})^2 - 2(-\frac{1}{2} - \frac{1}{2}) = \frac{1}{4} + 1 = \frac{5}{4}$

(1/2)

$s = -\frac{b}{a} = -\frac{1}{2} \quad p = \frac{c}{a} = -\frac{1}{2} \rightarrow s^2 - 2p = (-\frac{1}{2})^2 - 2(-\frac{1}{2}) = \frac{1}{4} + 1 = \frac{5}{4}$

ب) $s^3 - 2p = (-\frac{1}{2} - \frac{1}{2})^3 - 2(-\frac{1}{2} - \frac{1}{2}) = -1 - 1 = -2$

$s^2 - 3sp = (-\frac{1}{2})^2 - 3(-\frac{1}{2})(-\frac{1}{2}) = \frac{1}{4} - \frac{3}{4} = -\frac{1}{2}$

الف) $\binom{5}{2} + \binom{9}{2} = \frac{5!}{2!3!} + \frac{9!}{2!7!} = \frac{5 \times 4}{2} + \frac{9 \times 8}{2} = 10 + 36 = 46$

(1)

$\frac{5!}{2!3!} = \frac{5 \times 4 \times 3!}{2! \times 3!} = \frac{5 \times 4}{2} = 10$ $\binom{9}{2} = \frac{9 \times 8}{2} = 36$

ب) $\binom{9}{4} - \binom{1}{2} = \frac{9!}{4!5!} - \frac{1!}{2!} = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} - \frac{1}{2} = 126 - \frac{1}{2} = 125.5$

$\binom{9}{4} = \frac{9!}{4!5!} = \frac{9 \times 8 \times 7 \times 6 \times 5!}{4! \times 5!} = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} = 126$

$\binom{1}{2} = \frac{1 \times 1}{2} = \frac{1}{2}$