

الف $\text{ext} = \begin{bmatrix} -3 \\ -14 \end{bmatrix}$ $x = \frac{-b}{2a} = \frac{-4}{2} = -2$ $y = x^2 + 4x + 5$

$y = (-3)^2 + 4(-3) + 5 = -14$ جاگذاری

ب) $a > 0 \Rightarrow$ مینیمم دارد

اگر $x = 0 \Rightarrow y = 0^2 + 4(0) + 5 = 5$
عرض از مبدأ ۵ دارد

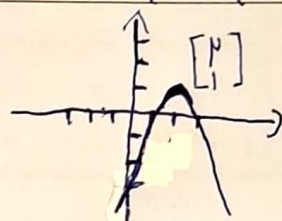


نمودار طول از مبدأهای ۵- و ۱- دارد

$x = -5$ و $x = 1$
 $y = 0 \Rightarrow x^2 + 4x + 5 = 0$
 $0 = (x+5)(x+1) = 0$

عرض از مبدأ آن هم -۳ است $y = -x^2 + 4x - 3$

الف $\text{ext} \begin{bmatrix} 2 \\ 1 \end{bmatrix}$ $x = \frac{-b}{2a} = \frac{-4}{-2} = 2$ $y = -(2)^2 + 4(2) - 3 = 1$ جاگذاری



max است $a < 0$

ب) $y = 0 \Rightarrow -x^2 + 4x - 3 = 0 \Rightarrow x^2 - 4x + 3 = 0$
 $x^2 - 4x + 3 = 0$
 $a + c + b = 0 \Rightarrow x = 1$ و $x = 3$

$\begin{bmatrix} 3 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ 0 \end{bmatrix}$
 $\begin{cases} x = 3 \\ x = 1 \end{cases}$

الف $\Rightarrow \Delta > 0 \Rightarrow b^2 - 4ac > 0 \Rightarrow (-3)^2 - 4(2)(1) > 0$
 $\Rightarrow 9 - 8 > 0 \Rightarrow 1 > 0$

ب) $\Delta = 0 \Rightarrow b^2 - 4ac = 0$
 $\Rightarrow (-3)^2 - 4(2)(1) = 0 \Rightarrow 9 - 8 = 1 \neq 0$

2) $\Delta < 0 \Rightarrow b^2 - 4ac < 0 \Rightarrow (-3)^2 - 4(2)(1) < 0 \Rightarrow 9 - 8 < 0 \Rightarrow 1 < 0$
 $a \in \mathbb{R}, x > \frac{q}{a}$

3) $\Delta \geq 0 \Rightarrow b^2 - 4ac \geq 0 \Rightarrow (-3)^2 - 4(2)(1) \geq 0 \Rightarrow 9 - 8 \geq 0 \Rightarrow 1 \geq 0$
 $a \in \mathbb{R}, x \leq \frac{q}{a}$

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

$\Rightarrow \begin{cases} x = 0.5 + \sqrt{1.5} \\ x = 0.5 - \sqrt{1.5} \end{cases}$

$\Rightarrow x - 1 = \pm \sqrt{1}$
 $\Rightarrow x = 1 + \sqrt{1}$ و $x = 1 - \sqrt{1}$

ب) $x^2 - x - 1 = 0 \Rightarrow x^2 - x + 1/4 - 1 = 1/4$

$\Rightarrow x^2 - x + 1/4 = 1/4 + 1$
 $(x - 0.5)^2 = 1.25$
 $\Rightarrow x - 0.5 = \pm \sqrt{1.25}$
 $\Rightarrow x = 0.5 \pm \sqrt{1.25}$

الف $x^2 - 2x - 1 = 0$
 $\Delta = b^2 - 4ac$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{4 + 4}}{2} = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$

ب) $x^2 + x - 4 = 0$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{1 + 16}}{2} = \frac{-1 \pm \sqrt{17}}{2}$

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

الف) $x^2 - 11x + 18 = 0 \Rightarrow (x-2)(x-9) = 0 \Rightarrow x=2 \vee x=9$
 ب) $x^2 + 13x - 18 = 0 \Rightarrow (x+18)(x-1) = 0 \Rightarrow x=-18 \vee x=1$

٦

الف) $\Delta x^2 - 12x + 7 = 0 \Rightarrow x^2 - 12x + 36 = 0 \Rightarrow (x-6)(x-6) = 0$
 $\Rightarrow x=6$
 ب) $\Delta x^2 - 10x + 1 = 0 \Rightarrow x^2 - 10x + 1 = 0 \Rightarrow (x-5)(x-2) = 0$
 $\Rightarrow x=5 \vee x=2$

٧

الف) $2x^2 - 5x + 2 = 0 \Rightarrow a+b+c=0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{5 \pm \sqrt{25 - 16}}{4} = \frac{5 \pm 3}{4}$
 $\Rightarrow x = 2 \vee x = \frac{1}{2}$
 ب) $2x^2 + 5x + 2 = 0 \Rightarrow a+c = -b \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-5 \pm \sqrt{25 - 16}}{4} = \frac{-5 \pm 3}{4}$
 $\Rightarrow x = -1 \vee x = -\frac{2}{3}$
 ٢) $2x^2 - 5x + 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{5 \pm \sqrt{25 - 8}}{4} = \frac{5 \pm \sqrt{17}}{4}$
 $\Rightarrow x = \frac{5 + \sqrt{17}}{4} \vee x = \frac{5 - \sqrt{17}}{4}$
 فائدة: ليس صيغتنا

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$x^2 - 13x - 1 = 0 \Rightarrow \Delta = b^2 - 4ac = 169 - 4 = 165 > 0 \Rightarrow S = \frac{-b}{a} = 13, P = \frac{c}{a} = -1$

الف) $S^2 - P = 13^2 - (-1) = 169 + 1 = 170$

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ب) $S^2 - 13S + P = 169 - 13(13) - 1 = 169 - 169 - 1 = -1$

الف) $\binom{V}{\omega} + \binom{q}{\mu} = \binom{V}{\mu} + \binom{q}{\omega} = \frac{V \times \mu}{\mu!} + \frac{q \times \omega}{\omega!} = 1 + 1 = 2$

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ب) $\binom{q}{\mu} - \binom{\omega}{\mu} = \frac{q \times \mu!}{\mu!} - \frac{\omega \times \mu!}{\mu!} = q - \omega$