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نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ..۱۳.. کلاس ......یازدهم تجربی......

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$y=(a-1)x^2+x+3 \xrightarrow[x=2]{\text{نشان دهنده}} x_{ext}=\frac{-b}{2a}=\frac{-1}{2(a-1)}=2 \to -1=4a-4 \to 4a=3 \to \boxed{a=\frac{3}{4}}$

$\Rightarrow (\frac{3}{4}-1)x^2+x+3=0 \xrightarrow{\times(-4)} x^2-4x-12=0 \to (x-6)(x+2)=0$

$x=6 \longrightarrow$ طول A، ق ق

$x=-2$ غ ق ق $\longrightarrow$ طول B، می خواهیم

این منحنی محور x ها را در $\boxed{x=6}$ قطع می‌کند

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$f(x)=mx^2-5x+m$

x		x_1		x_2	
$f(x)$	$-$	0	$+$	0	$-$

$I\cap II: \frac{-5}{2}<m<0$

1) $a<0 \to m<0 : I$

2) $\Delta>0 \to b^2-4ac>0 \to 25-4(m)(m)>0 \to 25-4m^2>0 \to \frac{25}{4}>m^2 \to \frac{5}{2}>m>\frac{-5}{2} : II$

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$x^2-Sx+P=0$

$S=\frac{3-\sqrt5}{3}+\frac{3+\sqrt5}{3}=\frac{\overbrace{3+3}^{6}-\sqrt5+\sqrt5}{3}=2$

$P=\frac{3-\sqrt5}{3}\times\frac{3+\sqrt5}{3}=\frac{9-5}{9}=\frac{4}{9}$

$\Rightarrow x^2-2x+\frac{4}{9}=0 \xrightarrow{\times 9} 9x^2-18x+4=0$

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$2x^2-8x+(m+2)=0 \to \alpha+\beta=\frac{-b}{a}=4,\ \alpha\beta=\frac{c}{a}=\frac{m+2}{2},\ \alpha^2+\beta^2=S^2-2P=16-m-2=14-m$

$3\alpha^2+\beta^2=12 \Rightarrow 2\alpha^2+\alpha^2+2\beta^2-\beta^2=12 \Rightarrow 2(\alpha^2+\beta^2)+(\alpha-\beta)(\overbrace{\alpha+\beta}^{4})=12 \to \cancel{2}(14-m)+\cancel{4}^{2}(-\sqrt{12-2m})=\cancel{12}^{6}$

$|\alpha-\beta|=\frac{\sqrt\Delta}{|a|} \to |\alpha-\beta|=\frac{\sqrt{64-4(2)(m+2)}}{2} \to \alpha-\beta=\frac{\cancel{2}\sqrt{12-2m}}{\cancel{2}} \to |\alpha-\beta|=\sqrt{12-2m} \xrightarrow{\alpha<\beta} \alpha-\beta=-\sqrt{12-2m}$

$\longrightarrow 14-m-2\sqrt{12-2m}=6 \longrightarrow 8-m=2\sqrt{12-2m} \xrightarrow{()^2} 64+m^2-16m=\overbrace{4(12-2m)}^{48-8m} \longrightarrow m^2-8m+16=0$

$\longrightarrow (m-4)^2=0 \longrightarrow m=4$

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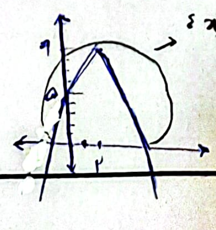
مختصات رأس سهمی $S(2,9)$: 1) $x_{ext}=\frac{-b}{2a}=2 \to \boxed{-b=4a}$ 2) $y_{ext}=\frac{-\Delta}{4a}=9 \to \frac{-b^2+\overbrace{4ac}^{-5b}}{\underbrace{4a}_{-b}}=9 \to \frac{b^2+5b}{b}=9$

عرض از مبدأ $\Rightarrow c=5$

$\to b^2+5b=9b \to b^2-4b=0 \to b(b-4)=0 \to$ $b=0$ غ ق ق ، $b=4$ ق ق $\to \boxed{a=-1} \longrightarrow -x^2+4x+5=0$

جمع ضرایب توان های زوج = فرد $\xrightarrow{-1+5=4}$ $x=-1$ ، $x=\frac{-c}{a}=5$

در کدام بازه سهمی در بالای محور x ها $\Rightarrow D_f:(-1,5)$



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$\beta > 0$ و α و β ریشه‌های معادله

$\alpha x^2 - 7x + 9\beta = 0$

$S = \frac{-b}{a} \Rightarrow \alpha + \beta = \frac{7}{\alpha} \rightarrow \alpha^2 + \alpha\beta = 7 \rightarrow \alpha\beta = -2$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{-1}{3} + \frac{3}{2} = \frac{-2+9}{6} = \frac{7}{6}$

$P = \frac{c}{a} \Rightarrow \alpha \cdot \beta = \frac{9\beta}{\alpha} \rightarrow \alpha^2 = 9 \rightarrow \begin{cases} \alpha = +3 \text{ زوج} \rightarrow -2 = \frac{\cancel{9}^{3}\beta}{\cancel{\alpha}} \rightarrow \beta = \frac{-2}{3} \text{ غ ق ق} \rightarrow 0 < \beta \\ \alpha = -3 \text{ ق ق} \rightarrow -2 = \frac{9\beta}{-3} \rightarrow 2 = 3\beta \rightarrow \beta = \frac{2}{3} \text{ ق ق} \end{cases}$

$k = x_{\text{رأس}}$

$f(x) = mx^2 + 4x + \left(\frac{m+14}{2}\right)$

$y_{max} = \frac{-\Delta}{4a} \longrightarrow \frac{-b^2 + 4ac}{4a} = 8 \longrightarrow \frac{-16 + 4(m)\left(\frac{m+14}{2}\right)}{4m} = 8 \rightarrow \frac{-8 + m^2 + 14m}{2m} = 8$ 8

$\longrightarrow m^2 + 14m - 8 = 16m \longrightarrow m^2 - 2m - 8 = 0 \longrightarrow (m-4)(m+2) = 0 \longrightarrow \begin{cases} m = 4 \longrightarrow \text{غ ق ق} \times \ a < 0 \\ m = -2 \rightarrow \text{ق ق} \checkmark \end{cases}$

$y_{max} \xrightarrow{\text{نتیجه}} a < 0 \xrightarrow{m=-2} f(x) = -2x^2 + 4x + 6 \xrightarrow{f(x)=0} -2x^2 + 4x + 6 = 0 \rightarrow -x^2 + 2x + 3 = 0$

جمع ضرایب اول و سوم = دوم

$-1 + 3 = 2$ → $\begin{cases} x_1 = -1 \\ x_2 = \frac{-c}{a} = 3 \end{cases} \longrightarrow x_{\text{مثبت}} = k \longrightarrow 3 = k$

$S \Rightarrow \frac{-b}{a} = -m \ (\alpha+\beta)$ ، $P \Rightarrow \frac{c}{a} = -2m \ (\alpha \cdot \beta)$

$S^2 - 2P = m^2 - 2(-2m) = m^2 + 4m$ ، $x^2 + mx - 2m = 0$

$m^2 + 4m = S^2 - 2P$

$\alpha^2 - m\beta = 8 \longrightarrow \alpha^2 + (\alpha+\beta)(\beta) = 8 \longrightarrow \alpha^2 + \beta^2 + \underbrace{\alpha\beta}_{-2m} = 8 \rightarrow m^2 + 2m = 8 \rightarrow m^2 + 2m - 8 = 0$

$\rightarrow (m+4)(m-2) = 0 \longrightarrow \begin{cases} m = -4 \text{ غ ق ق} \ , \ m = 2 \text{ ق ق} \end{cases} \rightarrow x^2 + 2x - 4 = 0 \rightarrow \Delta = 4 - 4(1)(-4) > 0$ 7

$\downarrow (\Delta = b^2 - 4ac)$

$x^2 - 4x + 8 = 0$ غ ق ق

$\Delta = 16 - \underbrace{4(1)(8)}_{-32} < 0$

$\longrightarrow m = 2 \longrightarrow \alpha + \beta = S \Rightarrow -m = -2$

$\alpha + \beta = -2$

عرض از مبدأ : $c = 4$

اکسترمم : $\begin{cases} x_{max} : \frac{-b}{2a} = 2 \longrightarrow -b = 4a \\ y_{max} : \frac{-\Delta}{4a} = 6 \longrightarrow \frac{+b^2 + 4a\cancel{c}^4}{\underset{+b}{4a}} = 6 \longrightarrow \frac{+b^2 + 4b}{+b} = 6 \rightarrow b^2 + 4b = 6b \rightarrow b^2 - 2b = 0 \rightarrow b(b-2) = 0 \rightarrow \begin{cases} b = 0 \text{ غ ق ق} \\ b = 2 \text{ ق ق} \end{cases} \end{cases}$

$ax^2 + bx + c = 0 \rightarrow \frac{-1}{2}x^2 + 2x + 4 = 0$

$\Delta = b^2 - 4ac \rightarrow \Delta = 4 - 4\left(\frac{-1}{2} \times 4\right) = 4 + 8 = 12$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{-2 \pm 2\sqrt{3}}{-1} = \begin{cases} x_1 = 2 - 2\sqrt{3} \\ x_2 = 2 + 2\sqrt{3} \end{cases}$ 9

مجموع معکوس ریشه ها :

$\frac{1}{x_1} + \frac{1}{x_2} = \frac{1}{2(1-\sqrt{3})} + \frac{1}{2(1+\sqrt{3})} = \frac{1+\sqrt{3}+1-\sqrt{3}}{(2)(1-3)} = \frac{2}{2 \times -2} = \frac{-1}{2}$ ، $a = \frac{-1}{2}$

$x^2 - \underbrace{(4a+4)}_{4(a+1)}x + \underbrace{(3a^2+6a+3)}_{3(a+1)^2} = 0 \xrightarrow{a+1=t} x^2 - (4t)x + (3t^2) = 0 \xrightarrow{x=2} 4 - 8t + 3t^2 = 0 \rightarrow t^2 - 8t + 12 = 0$

$(t-6)(t-2) = 0$

$\rightarrow \begin{cases} t = \frac{6}{3} = 2 \rightarrow (a+1 = 2 \rightarrow a = 1) \longrightarrow x^2 - 8x + 12 = 0 \rightarrow (x-6)(x-2) = 0 \Rightarrow \begin{cases} x = 2 \\ x = 6 \end{cases} \\ t = \frac{2}{3} \rightarrow \left(a + 1 = \frac{2}{3} \rightarrow a = \frac{-1}{3}\right) \rightarrow x^2 - \frac{8}{3}x + \frac{4}{3} = 0 \rightarrow \left(x - \frac{2}{3}\right)(x-2) = 0 \Rightarrow \begin{cases} x = 2 \\ x = \frac{2}{3} \end{cases} \end{cases}$ 10