Subject: دهم تجربی A

Year: Month: Date:

سارینا زارع

تکلیف ۲۴ — ۲۰

① الف) $y=2x^2-4x+1 \rightarrow \Delta=(-4)^2-(4\times2\times1)=16-8=8$

$a>0$ ← Min

$\text{Min}\left|\begin{matrix}\frac{-b}{2a} \rightarrow \frac{-b}{2a}=\frac{4}{4}=1\\ -\frac{\Delta}{4a} \rightarrow \frac{-8}{8}=-1\end{matrix}\right.$ $\text{ext}\left|\begin{matrix}1\\-1\end{matrix}\right.$ → سهمی Min دار

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ب) $y=-2x^2+3x-5 \rightarrow \Delta=9-40=-31$

$a<0$ ← Max

$\text{Max}\left|\begin{matrix}\frac{-b}{2a} \rightarrow \frac{-3}{-4}\\ \frac{\Delta}{4a}\end{matrix}\right. \rightarrow \text{Max}\left|\begin{matrix}\frac{3}{4}\\ \frac{-31}{8}\end{matrix}\right.$ → حاکسیم دار چون $a<0$

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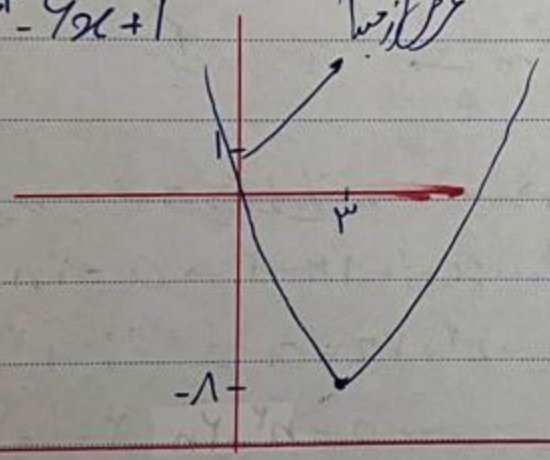
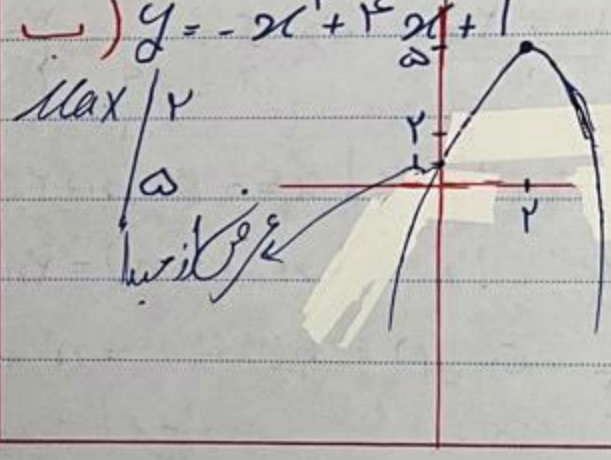
② الف) $y=x^2-6x+1$

$\text{Min}\left|\begin{matrix}3\\-8\end{matrix}\right.$



ب) $y=-x^2+4x+1$

$\text{Max}\left|\begin{matrix}2\\5\end{matrix}\right.$



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③ $4x^3+kx^2-9x-2=0$

$\alpha+\beta=1 \Rightarrow \alpha+\beta+\gamma=\frac{-k}{4} \rightarrow 1-\frac{1}{4}=\frac{-k}{4} \rightarrow k=-3$

$\alpha\beta=-2 \rightarrow \alpha\beta\gamma=\frac{2}{4}=\frac{1}{2} \rightarrow \gamma=\frac{-1}{4}$

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④ $x^2-3mx+m=0 \rightarrow \Delta=9m^2-4m$

$\sqrt{\alpha}-\sqrt{\beta}=1$

$|x_1-x_2|=\frac{\sqrt{\Delta}}{|a|} \Rightarrow \sqrt{9m^2-4m}=1 \xrightarrow{\text{توان ۲}} 9m^2-4m-1=0$ ☆

☆ $\rightarrow \Delta=(-4)^2-4\times9\times-1=16+36=52 \rightarrow m=\frac{4\pm\sqrt{52}}{18} \rightarrow \sqrt{52}=2\sqrt{13}$

$m=\frac{2\pm\sqrt{13}}{9}$

معادله (ج): $2x^2+mx-m=0 \rightarrow P=\frac{c}{a}=\frac{-m}{2} \rightarrow \frac{-m}{2}=-\frac{2+\sqrt{13}}{18}=\frac{2-\sqrt{13}}{9}$

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

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$y = 2x^2 - (m+2)x + m = 0 \xrightarrow{a+b+c=0}$ $x = 1$, $y(0) = m$ ③

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

$S = \frac{1}{2}|m(\frac{m}{2} - 1)| \rightarrow |m(\frac{m}{2} - 1)| = \frac{3}{2} \rightarrow |m(m-2)| = 3$ → $m = -1 \rightarrow \frac{m}{2} = \frac{-1}{2}$; $m = 3 \rightarrow \frac{m}{2} = \frac{3}{2}$

$\frac{m}{2} = \frac{-1}{2}, \frac{3}{2}$

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④ $y = ax^2 + 3x + a \rightarrow y_{min} = \frac{-\Delta}{4a} = \frac{4a^2 - 9}{4a} = a - \frac{9}{4a}$

$\Delta = 9 - 4a^2$

$a - \frac{9}{4a} = \frac{7}{8} \xrightarrow{\times 8a} 8a^2 - 18 = 7a \rightarrow 8a^2 - 7a - 18 = 0$

$\Delta = (-7)^2 - 4 \times 8 \times -18 = 49 + 576 = 625 \rightarrow \sqrt{625} = 25$

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$a = \frac{7 \pm 25}{16} \Rightarrow a = 2, \; a = \frac{-9}{8}$ } $a > 0 \rightarrow$ a یک عدد

⑦ $x^2 - (a+1)x + a = 0 \rightarrow$ ریشه‌های $n+2, n$ چون دو عدد فرد متوالی اند

$S = \frac{-b}{a} = 1 + a = n + (n+2) = 2n + 2 \rightarrow a + 1 = 2n + 2 \rightarrow a = 2n + 1$

$P = \frac{c}{a} = a, P = n(n+2) = n^2 + 2n \rightarrow n^2 + 2n = a \xrightarrow{a = 2n+1} n^2 + 2n = 2n + 1$

$n^2 = 1 \rightarrow n = 1 \longrightarrow$ چون طبیعی است انتخاب می‌شود $\rightarrow a = 2n + 1 = 2 + 1 = 3$ ✱

معادله دوم : $x^2 - (3a+1)x + b = 0 \xrightarrow{a=3} 3a + 1 = 10 \rightarrow$

بازنویسی معادله : $x^2 - 10x + b = 0 \longrightarrow$ ریشه‌ها دو عدد زوج متوالی $\rightarrow$ ریشه‌های $m+2, m$

$S = 2m + 2 = 10 \rightarrow 2m = 8 \rightarrow m = 4 \rightarrow$ ریشه‌ها $= 4, 6 \rightarrow P = 4 \times 6 = 24$ ✱✱

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✱ , ✱✱ $\rightarrow 24 - 3 = 21$

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$y_1 = -ax^2 + ax + 2 \rightarrow x_{1max} = \frac{-a}{2(-a)} = \frac{1}{2}$

$y_{1max} = -a(\frac{1}{2})^2 + a(\frac{1}{2}) + 2 = \frac{-a}{4} + \frac{a}{2} + 2 = \frac{a}{4} + 2$

این سهمی‌ها در x_1 : $y_2(x_1) = y_1(x_1)$

$y_2(\frac{1}{2}) = 2b(\frac{1}{2})^2 - b(\frac{1}{2}) - 1 = \frac{b}{2} - \frac{b}{2} - 1 = -1$

$\frac{a}{4} + 2 = -1 \rightarrow \frac{a}{4} = -3 \rightarrow a = -12$

$y_2 = 2bx^2 - bx - 1 \rightarrow x_{min_2} = -\frac{-b}{2 \times 2b} = \frac{1}{4}$

$y_2(x_2) = 2b(\frac{1}{4})^2 - b(\frac{1}{4}) - 1 = 2b \times \frac{1}{16} - \frac{b}{4} - 1 = \frac{-b}{8} - 1$

$\rightarrow y_1(x_2) = -a(\frac{1}{4})^2 + a(\frac{1}{4}) + 2 = \frac{3}{4} - 1 = -\frac{1}{4}$

$-\frac{1}{4} = \frac{-b}{8} - 1 \rightarrow -\frac{1}{4} + 1 = \frac{-b}{8} \rightarrow \frac{-b}{8} = \frac{3}{4} \rightarrow b = -6$

$b - a = -6 - (-12) = 12 - 6 = 6$ ✓

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$\alpha\beta = \frac{\beta}{2a\alpha} \rightarrow \alpha^2 = \frac{1}{2a} \rightarrow \alpha = \pm\frac{1}{a}$

$x = a \rightarrow 2a\alpha \times \frac{1}{2a} + 4\alpha + \beta = 0 \rightarrow a\alpha + \beta = 0 \rightarrow \beta = -a\alpha$

$\beta > 0 \longrightarrow \alpha = -\frac{1}{a}$, $\beta = 1$

$x_{رأس} = \frac{-b}{2a} = \frac{-4}{2(-a)} = \frac{2}{a}$ ، $y_{رأس} = -a(\frac{2}{a})^2 + 4(\frac{2}{a}) + 1 = \frac{9}{a}$

ext $\left|\begin{matrix}\frac{2}{a} \\ \frac{9}{a}\end{matrix}\right.$ → در ناحیه اول

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$a+b=S=\frac{-b}{a}$ $= a^2+b^2-12 = S^2-2P-12 \rightarrow P=S-1$ (10)

$a.b = a+b-1 \Rightarrow P = S-1$

بازنویسی : $S = S^2-2S+2-12 \Rightarrow S^2-3S-10=0 \rightarrow$ $\boxed{S=5}$ ✓

$S=-2 \rightarrow$ طبیعی پس a و b طبیعی نمی‌شود ✗

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