نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲.۴ کلاس .....

۱

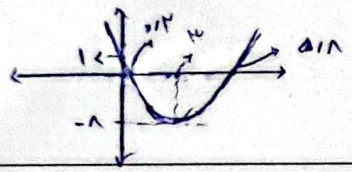
الف) $a>0 \rightarrow \min \rightarrow \left|\begin{matrix}\frac{-b}{2a}=\frac{4}{2\times 2}=1 \\ \frac{-\Delta}{4a}=\frac{-((-4)^2-4(2)(1))}{4\times 2}=\frac{-8}{8}=-1\end{matrix}\right. \rightarrow \min \left|\begin{matrix}1\\-1\end{matrix}\right.$

ب) $a<0 \rightarrow \max \rightarrow \left|\begin{matrix}\frac{-b}{2a}=\frac{-3}{2\times -2}=\frac{3}{4} \\ \text{جایگذاری} \rightarrow f=-2(\frac{3}{4})^2+3\times\frac{3}{4}-a=\frac{-9}{8}+\frac{9}{4}-a=\frac{-31}{8}\end{matrix}\right. \rightarrow \max \left|\begin{matrix}\frac{3}{4}\\ \frac{-31}{8}\end{matrix}\right.$

۲

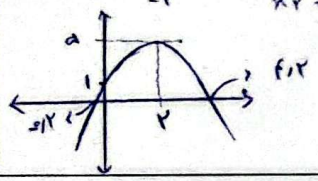
الف) $\min\limits_{a>0} \left|\begin{matrix}\frac{4}{2\times 1}=2 \\ 2^2-3\times 2+4\times 1=-1\end{matrix}\right.$ عرض از مبدا $=1$

$x_1, x_2=\frac{4\pm\sqrt{32}}{2}=\frac{4\pm 4\sqrt{2}}{2}$ $\begin{cases}x_1=2-2\sqrt{2}\simeq 0.12\\ x_2=2+2\sqrt{2}\simeq 4.8\end{cases}$



ب) $\max\limits_{a<0} \left|\begin{matrix}\frac{-b}{2a}=2 \\ -4+8+1=5\end{matrix}\right.$ عرض از مبدا $=1$

$x_1, x_2=\frac{-2\pm 2\sqrt{5}}{-2} \rightarrow \begin{matrix}x_1=2+\sqrt{5}\simeq 4.2\\ x_2=2-\sqrt{5}\simeq -0.2\end{matrix}$



۳

$x^2-(\alpha+\beta)x+\beta\alpha=0 \rightarrow x^2-x-2=0 \rightarrow (x-2)(x+1)=0 \Rightarrow \alpha=2, \beta=-1$

$\beta= \rightarrow 4(-1)^3+k(-1)^2-9(-1)-2=0 \rightarrow -4+k+9-2=0$

$\rightarrow k+3=0 \rightarrow k=-3$

۴

ریشه‌های $x^2-3mx+m=0$ $=\alpha, \beta \rightarrow \sqrt{\alpha}-\sqrt{\beta}=1 \xrightarrow{()^2} \alpha+\beta-2\sqrt{\alpha\beta}=1$

$3m=\frac{-b}{a}$ $\qquad 2\sqrt{\alpha\beta}=2\sqrt{\frac{c}{a}}=2\sqrt{m}$

$3m-2\sqrt{m}-1=0 \xrightarrow{\sqrt{m}=t} 3t^2-2t-1=0 \rightarrow t_1, t_2=\frac{2\pm\sqrt{16}}{6} \rightarrow$ $t_1=1$ ق ق، $t_2=-\frac{1}{3}$ غ ق ق

$t_1=1$, $t_2=\sqrt{m} \rightarrow m=(t)^2 \rightarrow m=1 \rightarrow 2x^2-mx-m=0 \xrightarrow{m=1} 2x^2-x-1=0$

$2x^2-x-1=0 \longrightarrow$ حاصلضرب ریشه‌ها $=\frac{c}{a}=\frac{-1}{2}$

۵

$2x^2-(m+2)x+m=0 \rightarrow a+b+c=0 \rightarrow x=1, x=\frac{m}{2}$ (ریشه‌های گویا)

$S=\frac{1}{2}\times m\times\frac{\sqrt{m^2+4-4m}}{2}=\left|\frac{3}{4}\right| \rightarrow m|m-2|=|3| \begin{cases}\rightarrow m|m-2|=3 \rightarrow m=3, m^2-2m-3=0 \rightarrow \begin{matrix}m=3 \text{ ق ق}\\ m=-1 \text{ غ ق ق}\end{matrix}\\ \rightarrow m|m+1|=-3 \rightarrow m=-3, m^2+2m+3=0 \rightarrow \begin{matrix}m=-3 \text{ غ ق ق}\\ m=2 \text{ ق ق}\end{matrix}\end{cases}$

$m=2 \rightarrow \frac{-b}{2a}=\frac{3}{2}$

$m=-1 \rightarrow \frac{-b}{2a}=\frac{-1}{2}$

۶

$y = ax^2 + 3x + a \rightarrow \min \Rightarrow a > 0$ ①

$ext \left| \begin{array}{l} \frac{-b}{2a} = \frac{-3}{2a} \\ \frac{-\Delta}{4a} = \frac{-9 + 4a^2}{4a} = \frac{7}{8} \rightarrow -18 + 8a^2 = 7a \rightarrow 8a^2 - 7a - 18 = 0 \end{array} \right.$

$\sqrt{625} = 25$

$\rightarrow a_1, a_2 = \frac{7 \pm \sqrt{(-7)^2 - 4(18)(8)}}{16} \rightarrow a_1 = \frac{7+25}{16} = 2 \quad a_2 = \frac{-18}{16} = \frac{-9}{8}$ $\xrightarrow{\text{طبق ①}}$ $a = 2$ فقط قابل قبول است

۷

$x^2 - (a+1)x + a = 0 \longrightarrow a+b+c = 0 \rightarrow 1 \quad \rightarrow 2x+1 = 3$

$x^2 - (3a+1)x + b = 0 \xrightarrow{a=3} x^2 - 10x + b = 0 \quad 2k \,,\, 2k+2$

$x_1 + x_2 = 4k + 2 \quad (x_1 = 4) \quad (x_2 = 6)$

$4k + 2 = 3a + 1 \Rightarrow k = 2$

$(4 \times 6) - (3 \times 1) = 21$

۸

$y = -ax^2 + ax + 2 \rightarrow S:(\frac{1}{2}, \frac{a}{4} + 2)$

$y = 2bx^2 - bx - 1 \rightarrow S:(\frac{1}{4}, \frac{-b}{8} - 1)$

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

$-a(\frac{1}{16}) + a(\frac{1}{4}) + 2 = \frac{-b}{8} - 1 \rightarrow \frac{3}{4} - 3 + 2 = \frac{-b}{8} - 1 \rightarrow b = -6$

$b - a = -6 - (-12) = 6$

۹

$y = 25\alpha x^2 - 4x + \beta \,,\, \beta > \alpha \,,\, \beta + \alpha = \frac{-b}{a} = \frac{-4}{25a}$ ①

$\alpha\beta = \frac{\beta}{25\alpha} \rightarrow \alpha^2 = \frac{1}{25} \rightarrow \alpha = \pm\frac{1}{5}$

$x = \alpha \Rightarrow 25\alpha \times \frac{1}{25} + 4\alpha + \beta = 0 \rightarrow 5\alpha + \beta = 0 \quad \beta = -5\alpha$

$\alpha = -\frac{1}{5} \,,\, \beta = 1$

① $-5x^2 + 4x + 1 \rightarrow ext \left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{2(25\alpha)} = \frac{-2}{25\alpha} = \frac{2}{5} \\ y = \frac{9}{5} \end{array} \right\}$ رأس سهمی در ناحیه ① قرار دارد

۱۰

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

$ab = \frac{c}{a} \rightarrow a + b - 1 = ab \rightarrow S - 1 = P \rightarrow S^2 - 2S + 2 - 12 - S = 0$

$S^2 - 3S - 10 = 0 \rightarrow (S-5)(S+2) = 0 \rightarrow S = 5$ ق ق

$S = -2 \rightarrow$ غ ق ق

چون باید طبیعی باشند