تکلیف ۲۴ — به نام خدا. — محمدرضا اشراقی دهم ب B

۱)

الف) $y = 2x^2 - 4x + 1$ min

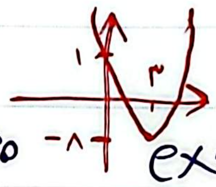
$$ext\begin{cases} \frac{-b}{2a} = \frac{4}{4} = 1 \\ \frac{-\Delta}{4a} \text{ یا } \Rightarrow 2(1) - 4(1) + 1 = -1 \end{cases} \Rightarrow ext\begin{cases} 1 \\ -1 \end{cases}$$

ب) $y = -2x^2 + 3x - 5$ max

$$ext\begin{cases} \frac{-b}{2a} \to -\frac{3}{-4} = \frac{3}{4} \\ \text{یا } \frac{-\Delta}{4a} \Rightarrow \frac{4ac - b^2}{4a} = \frac{40-9}{-8} = -\frac{31}{8} \end{cases} \leftarrow ext\begin{cases} \frac{3}{4} \\ \frac{-31}{8} \end{cases}$$

۲)

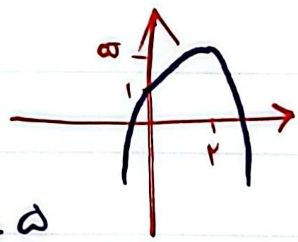
الف) $y = x^2 - 6x + 1 \xrightarrow{x=0} c=1$, $a>0$



$$ext\begin{cases} \frac{-b}{2a} \Rightarrow \frac{6}{2} = 3 \\ \frac{-\Delta}{4a} \text{ یا } \checkmark \Rightarrow (3)^2 - 6(3) + 1 = -8 \end{cases}$$

ب) $y = -x^2 + 4x + 1 \xrightarrow{x=0} c=1$, $a<0$

$$ext\begin{cases} \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ \frac{-\Delta}{4a} = -(2)^2 + 4(2) + 1 = 5 \end{cases}$$



۳)

$x^2 - Sx + P$: $S \to = \alpha + \beta = 1$, $P \to = \alpha\beta = -2$ } $x^2 - x - 2$ $\begin{cases} \alpha = -1 \text{ و } \beta = 2 \\ \text{یا} \\ \alpha = 2 \text{ و } \beta = -1 \end{cases}$

if $\alpha = -1$ یا $\beta = -1$ $\longrightarrow 4x^3 + kx^2 - 9x - 2 = 0 \to -4 + k + 9 - 2 = 0$

$k = -3$

۴)

$\sqrt{\alpha}-\sqrt{\beta}=1 \xrightarrow{\text{توان ۲}} \alpha+\beta-2\sqrt{\alpha\beta}=1 \Rightarrow S-2\sqrt{\alpha\beta}=1$

$3m-2\sqrt{m}=1$

$\rightarrow 3m-2\sqrt{m}-1=0 \rightarrow \sqrt{m}=1 , \underbrace{\frac{1}{3}}_{\text{غ ق ق}} \Rightarrow m=1 \Rightarrow 2x^2+x-1=0$

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

۵)

$y=2x^2-(m+2)x+m \quad \alpha-\beta=\frac{\sqrt{\Delta}}{|a|} \Rightarrow \frac{\sqrt{(m+2)^2-8m}}{2}=$

$S=\frac{1}{2}\times\frac{|m-2|}{2}m=\frac{3}{4}$ $\quad \frac{\sqrt{(m-2)^2}}{2}=\frac{|m-2|}{2}$

$|m-2|m=3 \rightarrow m^2-2m=3 \Rightarrow m^2-2m-3=0$

$\Rightarrow m=3 , -1$

$y=x^2-mx+1$

$y=x^2-3x+1 \Rightarrow x=\frac{-b}{2a}=\frac{3}{2}$

$y=x^2+x+1 \Rightarrow x=\frac{-b}{2a}=-\frac{1}{2}$

۶)

$y=ax^2+3x+5 \rightarrow a(\frac{-3}{2a})^2+3(\frac{-3}{2a})+a=\frac{7}{8}$

$x_s=\frac{-b}{2a}=\frac{-3}{2a} \quad x=\frac{-3}{2a}$

y_{min}

$\frac{-9+20a^2}{12a}=\frac{7}{8} \Leftarrow a(\frac{9}{4a^2})=\frac{9}{4a}$

جواب = یک عدد

$\Delta=49+576=625$

$8a^2-7a-18=0$

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$a=\frac{+7\pm\sqrt{625}}{16} \rightarrow a_1=\frac{7+25}{16}=2$

$\rightarrow a_2=\frac{7-25}{16}=\frac{-9}{8}$ غ ق ق

$\left.\begin{matrix} S>0 \\ P<0 \end{matrix}\right\}$ min ... a>0

۷

$x^2-(a+1)x+a=0 \xrightarrow{a+b+c=0} \begin{cases} x=۳ \\ x_2=1 \end{cases}$

$x_1=\frac{c}{a}=a \rightarrow a=۳$

$x^2-(۳a+1)x+b=0$

$x^2-10x+b=0 \Rightarrow S=10 \rightarrow \begin{cases} x_1=۴ \\ x_2=۶ \end{cases}$

$P_2-P_1=(۶\times۴)-(۳\times1)=۲1$

۸

$y_1=-ax^2+ax+۲ \rightarrow ext\begin{cases} \frac{-b}{۲a} \\ \frac{-a}{-۲a}=\frac{1}{۲} \end{cases}$

$a_1=-a$ و $b_1=a$

$y_2=۲bx^2-bx-1$

$ext\begin{cases} \frac{-b}{۲a} \rightarrow \frac{b}{۴b}=\frac{1}{۴} \\ \frac{-\Delta}{۴a} \end{cases}$

$\frac{-a}{۴}+\frac{a}{۲}+۲=\frac{a+۸}{۴}$

$\rightarrow \frac{b}{۸}-\frac{b}{۴}-1=\frac{-b-۸}{۸}$

جواب نهایی

$\frac{b}{۲}-\frac{b}{۲}-1=\frac{a+۸}{۴} \Rightarrow a=-1۲$

$b-a=-۶-(-1۲)=۶$

$\frac{۳}{۲}-۳+۲=\frac{-1}{۲} \Rightarrow \frac{-b-۸}{۸}=\frac{-1}{۲} \Rightarrow b+۸=۲ \Rightarrow b=-۶$

۹

if $\beta>\alpha$ و $y=۲۵ax^2+۴x+\beta \rightarrow \alpha+\beta=-\frac{۴}{۲۵a}$

$\rightarrow \alpha\beta=\frac{\beta}{۲۵a} \Rightarrow ۲۵a^2=1$

if $\alpha=\frac{1}{۵} \Rightarrow \beta=-1$

if $\alpha=\frac{-1}{۵} \Rightarrow \beta=1$

$\xrightarrow{\beta>\alpha} x_S=\frac{-b}{۲a}=\frac{-۴}{-10}=\frac{۲}{۵}$

$y=-۵\times\frac{۴}{۲۵}+\frac{۸}{۵}+1=\frac{۹}{۵}$ → ربع اول

ب)

$y = x^2 - (a^2 + b^2 - 12)x + a + b - 1 = 0 \Rightarrow S = a^2 + b^2 - 12 \Rightarrow S = \alpha + \beta$

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

$S = S^2 - 2P - 12$

$\Rightarrow S = S^2 - 2S + 2 - 12 \Rightarrow S^2 - 3S - 10 = 0$

$(S-5)(S+2)$

$S = 5 \quad , \quad -2$ غ ق ق