پاسخ سوال دهم پر A تکلیف شماره ۲۴

(۱)

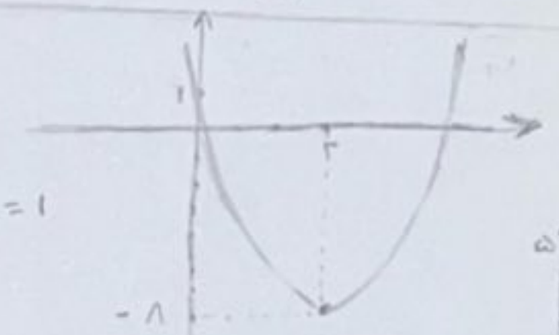
الف) $y=2x^2-4x+1$ $\quad a>0 \Rightarrow Min \Rightarrow ext \begin{cases} -\frac{b}{2a}=-\frac{-4}{4}=1 \\ -1 \longrightarrow 2\times1-4+1 \end{cases}$

ب) $y=-2x^2+3x-5$ $\quad a<0 \Rightarrow Max \Rightarrow ext \begin{cases} -\frac{b}{2a}=-\frac{3}{-4}=\frac{3}{4} \\ -\frac{\Delta}{4a}=-\frac{9+4\times-5\times-2}{-8}=-\frac{31}{8} \end{cases}$

(۲)

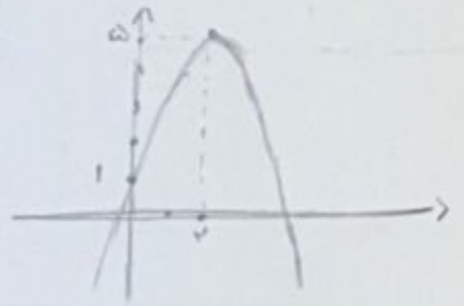
الف) $y=x^2-4x+1$ $\quad a>0 \Rightarrow Min \Rightarrow ext \begin{cases} -\frac{b}{2a}=-\frac{-4}{2}=2 \\ -8 \end{cases}$

$x=0 \Rightarrow y=1$



ب) $y=-x^2+4x+1$ $\quad a<0 \Rightarrow Max \Rightarrow ext \begin{cases} -\frac{b}{2a}=-\frac{4}{-2}=2 \\ 5 \end{cases}$

$x=0 \quad y=1$



(۳)

$4x^3+kx^2-9x-2=0 \quad \alpha+\beta=1 \quad \alpha\beta=-2 \quad z=$ ریشه‌ی سوم $\quad \frac{\alpha\beta z}{-2}=-\frac{2}{24}\times1 \Rightarrow z=-\frac{1}{4}$

$x=-\frac{1}{4} \Rightarrow 4\times\frac{-1}{64}+k\times\frac{1}{16}+\frac{9}{4}-2=0 \Rightarrow \underline{k=-2}$

(۴)

$x^2-2mx+m=0 \Rightarrow \alpha,\beta \Rightarrow \alpha+\beta=2m \quad |\sqrt{\alpha}-\sqrt{\beta}|=1 \xrightarrow{\text{توان ۲}} \alpha+\beta-2\sqrt{\alpha\beta}=1 \Rightarrow 2m-2\sqrt{m}=1 \Rightarrow 2m-1=2\sqrt{m}$

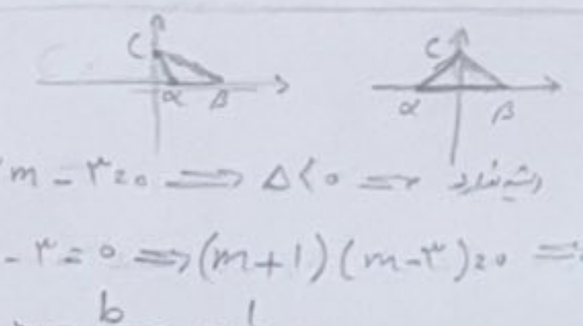
$\Rightarrow m=\alpha\beta$

$\xrightarrow{\text{توان ۲}} 4m^2+1-4m=4m \Rightarrow 4m^2-8m+1=0 \xrightarrow{\text{جواب‌ها}} m=1 \checkmark$, $m=\frac{c}{a}=\frac{1}{4}$ ✗ $\quad \Delta>0$

$2x^2+mx-m=0 \quad P=-\frac{m}{2}=-\frac{1}{2}$

(۵)

$y=2x^2+(-2-m)x+m$



$\frac{c\times|\alpha-\beta|}{2}=\frac{3}{4} \Rightarrow m\times\frac{\sqrt{\Delta}}{4}=\frac{3}{4} \Rightarrow m\times\sqrt{m^2-4m+4}=3$

$\Rightarrow m\times|m-2|=3$ ← $-m^2+2m-2<0 \Rightarrow \Delta<0 \Rightarrow$ ریشه ندارد

← $m^2-2m-3=0 \Rightarrow (m+1)(m-3)=0 \Rightarrow m=-1, m=3$

$y=x^2-mx+1 \longrightarrow m=-1 \longrightarrow -\frac{b}{2a}=-\frac{1}{2}$

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

(۶)

$y=ax^2+3x+a \quad Min \Rightarrow a>0 \quad -\frac{\Delta}{4a}=\frac{7}{8} \Rightarrow \frac{-9+4\times a\times a}{16a}=\frac{7}{8} \Rightarrow \frac{4a^2-9}{4a}=\frac{7}{2}$

$\Rightarrow 8a^2-18-7a=0 \Rightarrow a^2-7a-18=0 \Rightarrow (a-9)(a+2)=0 \longrightarrow a=\frac{18}{8}=2.25$ ✗ $\Delta<0$

$\searrow a=-\frac{9}{8}$ ✓

(۷)

$x^2+(-a-1)x+a=0 \xrightarrow{a+b+c=0} x=1, x=a$ ← ریشه‌ی مشترک $\Rightarrow a=3 \quad P=3$

$x^2-10x+b=0 \quad \alpha, \alpha+2 \quad \alpha+\alpha+2=10 \Rightarrow \alpha=4 \Rightarrow P=\alpha(\alpha+2)=4\times6=24$

$24-3=21$

(۸)

$y=-ax^2+ax+2 \quad x_e=-\frac{b}{2a}=\frac{1}{2} \Rightarrow y_e=\frac{a}{4}+2 \xrightarrow{y'} \frac{a}{4}+2=2b\times\frac{1}{4}-\frac{b}{2}-1 \Rightarrow a=-12$

$y'=2bx^2-bx-1 \quad x_e=-\frac{b}{2a}=\frac{b}{4b}=\frac{1}{4} \Rightarrow y'_e=\frac{b}{8}-\frac{b}{4}-1=-\frac{b}{8}-1 \xrightarrow{y} -(\frac{b}{8}+1)=\frac{12}{16}-\frac{12}{4}+2-\frac{1}{4} \Rightarrow \frac{b}{8}+1=\frac{1}{4} \Rightarrow b=-6$

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

(۹)

$y=2\sqrt{5}\alpha x^2+4x+\beta \quad \alpha<\beta \quad \alpha\beta=\frac{\beta}{2\sqrt{5}\alpha} \Rightarrow \alpha^2=\frac{1}{20} \Rightarrow \alpha=\pm\frac{1}{\sqrt{5}} \quad x=\alpha \Rightarrow 2\sqrt{5}\times\alpha\times\frac{1}{20}+4\alpha+\beta=0$

$\beta=-5\alpha \longrightarrow \beta>\alpha \longrightarrow \alpha=-\frac{1}{5}, \beta=1$ $\quad ext \begin{cases} -\frac{b}{2a}=\frac{-4}{-5}=\frac{4}{5} \\ 2\sqrt{5}\times-\frac{1}{5}\times\frac{16}{20}+4\times\frac{4}{5}+1=1 \end{cases}$

ربع اول

(۱۰)

$x^2-(a^2+b^2-12)x+a+b-1=0 \quad a+b=a^2+b^2-12 \quad ab=a+b-1$

$(a+b)^2=a^2+b^2+2ab \Rightarrow (a+b)^2-2ab=a^2+b^2 \Rightarrow a+b+12=(a+b)^2-2(a+b+-1) \Rightarrow (a+b)^2-4(a+b)-10=0$

$(a+b-5)(a+b+2)=0 \longrightarrow a+b=5$

$a+b=-2$