۱- $-\frac{b}{2a}=2 \to \frac{-1}{2(a-1)}=2 \to a=\frac{3}{4} \Rightarrow y=-\frac{1}{4}x^2+x+3 \to \Delta=1+3=4 \Rightarrow$

$x=\frac{-1\pm 2}{-\frac{1}{2}} = -2 \ ,\ 6$

(۲)

۲- $|x_1-x_2|=\frac{\sqrt{\Delta}}{|a|}>0 \Rightarrow \frac{\sqrt{25-4m^2}}{|m|}>0 \to$ $-\infty \ \ -\frac{5}{2} \ \ 0 \ \ \frac{5}{2} \ \ +\infty$: $- \ + \ + \ -$ $\to [-\frac{5}{2},\frac{5}{2}]-\{0\}$

$m\neq 0$ $\qquad -\frac{5}{2}<m<0$

(۱)

۳- $\frac{3-\sqrt{5}}{2}+\frac{3+\sqrt{5}}{2}=2=S$

$\left(\frac{3-\sqrt{5}}{2}\right)\left(\frac{3+\sqrt{5}}{2}\right)=\frac{9-5}{4}=\frac{4}{9}=P$

$\to x^2-Sx+P=0 \Rightarrow x^2-2x+\frac{4}{9}=0 \xrightarrow{\times 9}$ ضرایب صحیح

(۱,۵)

۴- $2(\alpha^2+\beta^2)+\underbrace{(\alpha^2-\beta^2)}_{(\alpha-\beta)(\alpha+\beta)}=12 \Rightarrow 2\left(16-2\left(\frac{m+2}{2}\right)\right)+(-4)\left(\frac{\sqrt{64-8m-16}}{2}\right)=12 \Rightarrow 16=2m+2\sqrt{48-8m} \Rightarrow$

$8=m+\sqrt{48-8m} \xrightarrow{\text{توان ۲}} (8-m)^2=\sqrt{48-8m} \to$ $m^2-8m+16=0 \to (m-4)^2=0 \to m=4$

$64+m^2-16m=48-8m$ | $m^2-24m+112=0$

$\Delta<0$ غ ق ق

(۲)

۵- $ax^2+bx+\underset{5}{c}=y \Rightarrow -x^2+4x+5>0 \to$ $-\infty \ \ -1 \ \ 5 \ \ +\infty$: $- \ + \ -$ $\to (-1,5)$

$x=-1,5$

$-\frac{b}{2a}=2 \to b=-4a$

$-\frac{\Delta}{4a}=9 \to \frac{b^2-4ac}{-4a}=9 \to \frac{b^2+5b}{b}=9 \to b=4 , a=-1$

(۲)

۶- $\alpha+\beta=\frac{7}{\alpha} \Rightarrow \alpha^2+\alpha\beta=7$

$\alpha\beta=\frac{9\beta}{\alpha} \to \alpha^2\beta=9\beta \longrightarrow \alpha=\pm 3$ $\xrightarrow{\alpha=-3} 9-3\beta=7 \to \beta=\frac{2}{3}$ ق ق $\Rightarrow$

$\xrightarrow{\alpha=3} 9+3\beta=7 \to \beta=-\frac{2}{3}$ غ ق ق

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

(۲)

۷- $x=\beta \to \beta^2-2m=-m\beta \Rightarrow \underbrace{\alpha^2+\beta^2}_{m^2+4m}-2m=8 \to m^2+2m-8=0$

$(m+4)(m-2)=0 \to -4$ $\quad \Delta<0$ ✗

$\to 2$ $\quad \Delta>0$ ✓

$\alpha+\beta=m=-4+2=-2$ $\qquad m=-S=-2$

(۱,۵)

۸- $\frac{b^2-4ac}{-4a}=1 \Rightarrow 16-12m^2-48m=-36m \Rightarrow$

$-3m^2+12m+16=0 \xrightarrow{\text{تقسیم بر}} m^2+4m-32=0$

$(m+8)(m-4)=0 \rightarrow \frac{12}{-3}=-4$ قابل قبول

$\frac{-8}{-2}=+4$ غیر قابل قبول $\rightarrow$ $\Delta=16-144<0$

$f(x)=-2x^2+12x+16 \xrightarrow[a+c=b]{\text{شرط}} -1, 8 \rightarrow k=8$

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

$-\frac{b}{4a}=2 \rightarrow b=-8a$

$\frac{b^2-4ac}{-4a}=6 \rightarrow \frac{b^2+8b}{b}=6 \rightarrow b=2 \text{ و } a=-\frac{1}{2}$

$\frac{1}{\alpha}+\frac{1}{\beta}=\frac{\alpha+\beta}{\alpha\beta}=\frac{+8}{-16}=-\frac{1}{2}$

۱۰- $x=2 \rightarrow 8-10a-16+3a^2+6a+3=0 \Rightarrow$

$3a^2-4a-1=0 \xrightarrow{a+b+c=0} 1, -\frac{1}{3}$

$a=1 \rightarrow x^2-10x+12=0 \rightarrow \Delta=64-48=16 \rightarrow x=\frac{10\pm 8}{2}$ ← ۲ ← ۶

$a=-\frac{1}{3} \rightarrow x^2-\frac{10}{3}+\frac{8}{3}=0 \rightarrow \Delta=\frac{64}{9}-\frac{16}{3}=\frac{16}{9} \rightarrow x=\frac{\frac{10}{3}\pm\frac{8}{3}}{2}=$

← ۲ ← $\frac{2}{3}$