ریاضی دهم تجربی   تکلیف ۱۳   زهرا جیعانی   ۱۵

۱ـ

$y=(a-1)x^{۲}+x+۳ \to -\frac{b}{۲a}=۲ \to \frac{-۱}{۲a-۲}=۲$ ۲

$۴a-۴=-۱ \to ۴a=۳ \to a=\frac{۳}{۴}$

$y=0 \to -\frac{۱}{۴}x^{۲}+x+۳=0 \xrightarrow{\times ۴} x^{۲}-۴x-۱۲=0$

$(x-۶)(x+۲)=0$

$\boxed{x=۶}$ $x=-۲$ غ ق ق

۲ـ

$mx^{۲}-۵x+m$

	x_1		x_2	
−	0	+	0	−

$\to m<0 \to P>0 \to P=۱$

$S<0$ ۱

$x_1=\frac{۱}{x_2} \to \frac{۱}{x^{۲}}+x^{۲}=\frac{۵}{m}$

$\Delta>0 \to ۲۵-۴m^{۲}>0 \to ۲۵>۴m^{۲} \to \frac{۲۵}{۴}>m^{۲} \to \frac{۵}{۲}>m$

$-\frac{۵}{۲}<m<\frac{۵}{۲}$

$-\frac{۵}{۲}<m<0$

Arman

۴/۱۱

$S = \dfrac{3-\cancel{\sqrt{5}}+3+\cancel{\sqrt{5}}}{3} = 2$ — ۳

۱/۵

$P = \dfrac{3-\sqrt{5}}{3} \times \dfrac{3+\sqrt{5}}{3} = \dfrac{9-5}{9} = \dfrac{4}{9}$

$\to x^2 - Sx + P = 0 \to x^2 - 2 + \dfrac{4}{9} \xrightarrow{\times 9}$

$\boxed{9x^2 - 18x + 4 = 0}$

$\alpha, \beta \Rightarrow 2x^2 - 8x + m + 2 = 0 \begin{cases} S = 4 \\ P = \dfrac{m+2}{2} \end{cases}$ — ۴

۰/۵

$\alpha^2 + \beta^2 + 2\alpha^2 = 12$

$\underbrace{(S^2 - 2P)}_{16 - m - 2} + 8\alpha - m - 2 = 12$

$2\alpha^2 = 8\alpha - m - 2$

$8\alpha - 2m \cancel{+14} = \cancel{14} \to 4\alpha = m$

$2(S^2 - 4P) - (S)\left(\dfrac{\sqrt{5}}{151}\right) = 2$

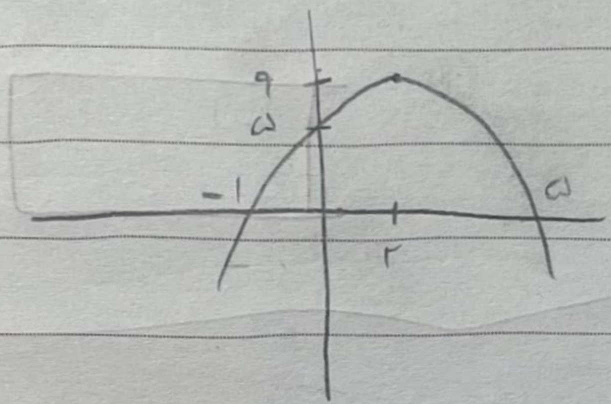
$m = 4$

Arman

$f(x) = ax^{۲} + bx + c \rightarrow \underline{c = ۵}$ — ۵

$-\frac{b}{۲a} = ۲ \rightarrow -b = ۴a \rightarrow b = -۴a$ $\qquad \underline{b = ۴}$ ۲

$x = ۲ \rightarrow ۴a + ۲b + \cancel{۵} = \cancel{۹}_{۴} \rightarrow ۲a + \underbrace{b}_{-۴a} = ۲ \rightarrow \underline{a = -۱}$



$f(x) = -x^{۲} + ۴x + ۵$

$(-x + ۵)(x + ۱) = ۰$

$x = ۵ \; , \; -۱$

$\boxed{x \Rightarrow (-۱, ۵)}$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{S}{P}$ — ۶

۰/۵

$S = \frac{۷}{\alpha}$ $\qquad \frac{۷}{\alpha} + \frac{۹\beta}{\alpha} = \frac{۷ + ۹\beta}{\cancel{\alpha}} = \frac{\alpha + \beta}{\cancel{\alpha}\beta}$

$P = \frac{۹\beta}{\alpha}$

$۷\beta + ۹\beta^{۲} - \beta = \alpha$

$\alpha\beta = \frac{۹\beta}{\alpha}$ $\qquad \alpha = \pm ۳$

$۹\beta^{۲} + ۶\beta = \alpha$

$\alpha + \beta = \frac{۷}{\alpha}$ $\begin{cases} \alpha = ۳ & \beta = \frac{-۲}{۳} ✗ \\ \alpha = -۳ & \beta = \frac{۲}{۳} ✓ \end{cases}$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{۷}{۶}$

۷ـ ۱٫۵

$x^2 + mx - 2m = 0 \quad \begin{cases} \alpha \to S = -m \\ \beta \to P = -2m \end{cases}$

$\alpha^2 - m\beta = 8 \to \underbrace{-m(S)} + 2m = 8$

$-m\alpha + 2m$

$+m^2 + 2m - 8 = 0 \to (m+4)(m-2) = 0$

$\to m = 2 \ , \ -4$

$D>0$ ✓ $\quad D<0$ ✗

$S = -m \Rightarrow \boxed{-2 \ , \ 4}$

۸ـ

$mx^2 + 4x + \frac{m}{2} + 7 = f(x)$

$-\frac{\Delta}{4a} = 8 \to 32a = 4ac - b^2$

$32m + 16 = 4(m)\left(\frac{m}{2} + 7\right)$

$m^2 - 2m - 8 = 0 \quad \leftarrow \quad 0 = \underbrace{2m^2 + 28m - 32m} - 16$

$(m-4)(m+2) = 0 \qquad 2m^2 - 4m - 16 = 0$ ۵

$m = 4 \ , \ -2 \to$ ماکزیمم $\to m<0 \to \boxed{m = -2}$

غ ق ق   ق ق

$-2x^2 + 4x + 6 = 0 \to x^2 - 2x - 3 = 0 \to (x-3)(x+1) = 0 \to \begin{cases} x = 3 \\ x = -1 \end{cases}$

Arman $\boxed{k = 3}$

-۹

$ax^2+bx+c=f(x) \begin{cases}\alpha\\ \beta\end{cases}$

$\dfrac{1}{\alpha}+\dfrac{1}{\beta}=?$

$\underline{c=4}$ ، $\dfrac{-b}{2a}=2 \rightarrow 4a=-b \xrightarrow{\times 2}$

$\dfrac{-\Delta}{4a}=6 \rightarrow 24a=\underbrace{4ac}_{16a}-b^2 \rightarrow b^2=-8a$

$\begin{cases}\cancel{8a}=-2b\\ \cancel{-8a}=b^2\end{cases} (+) \Rightarrow b^2-2b=0 \rightarrow b=0$ غ ق ق ، $2 \rightarrow$ ق ق

$\underline{b=2} \rightarrow \underline{a=-\dfrac{1}{2}}$

$-\dfrac{1}{2}x^2+2x+4 \xrightarrow{\times -2} x^2-4x-8=0 \rightarrow \sqrt{48}=4\sqrt{3}$

$\rightarrow \alpha,\beta=\dfrac{4\pm\sqrt{16+32}}{2}$

$\begin{cases}\dfrac{1}{\alpha}=\dfrac{1}{2+2\sqrt{3}}\\ \dfrac{1}{\beta}=\dfrac{1}{2-2\sqrt{3}}\end{cases} (+) \rightarrow \dfrac{2-\cancel{2\sqrt{3}}+2+\cancel{2\sqrt{3}}}{4-12}=\dfrac{4}{-8}$

(۲)

$\rightarrow \dfrac{1}{\alpha}+\dfrac{1}{\beta}=\boxed{-\dfrac{1}{2}}$

Arman

۱۰-

$x = 2$

$\cancel{4} - 8a - \cancel{8} + \cancel{12}a^2 + \cancel{4}a + \cancel{4} = 0$

$3a^2 - 2a - 1 = 0$

$a^2 - 2a - 3 = 0 \quad (a-3)(a+1) = 0$

$\underline{a = 1 ,\ -\frac{1}{3}} \to a = 1 \to x^2 - 8x + 12 = 0$

$a = -\frac{1}{3} \to x^2 - \frac{8}{3}x + \frac{4}{3} = 0 \xrightarrow{\times 3}$

$x^2 - 8x + 12$

$(x-6)(x-2) = 0 \to \underline{x = 2 ,\ x = 6}$

۲

$3x^2 - 8x + 4 = 0 \to x^2 - 8x + 12 = 0 \to (x-6)(x-2)$

$\underline{x = 2} \qquad \underline{x = \frac{2}{3}}$

$x_1 = 2$

$\boxed{x_2 = \frac{2}{3} ,\ 6}$

Arman