DATE / /

Subject:

دهم ریاضی [illegible] نظمیه ۲۳

نام: [illegible] ۲۵ فاطمه [illegible]

سوال ۱)

$$-\frac{b}{2a} = -1 \Rightarrow b = 2a$$

$$y = ax^2 + bx + c \quad (b = 2a)$$

$$y = ax^2 + 2ax + c \Rightarrow 9 = a - 2a + c \Rightarrow 9 = -a + c \quad \left|\begin{matrix}-1\\9\end{matrix}\right.$$

$$\left|\begin{matrix}3\\1\end{matrix}\right. \Rightarrow 1 = 9a + 6a + c \Rightarrow 1 = 15a + c$$

$$\Rightarrow c = 9 + a$$

$$c = 1 - 15a \Rightarrow 9 + a = 1 - 15a$$

$$\Rightarrow 16a = -8$$

$$\Rightarrow a = -\frac{1}{2}$$

$$\Rightarrow c = \frac{17}{2}$$

$$\Rightarrow b = -1$$

$$\Rightarrow \boxed{y = -\frac{1}{2}x - x + \frac{17}{2}}$$

سوال ۲)

$$2x^2 + mx + m + 6 = 0$$

(1) $P = \frac{c}{a} = \frac{m+6}{2} > 0 \Rightarrow m > -6$

(2) $-\frac{b}{a} = S = \frac{-m}{2} > 0 \Rightarrow -m > 0 \Rightarrow m < 0$

(3) $\Delta = b^2 - 4ac > 0 \Rightarrow m^2 - 4(m+6)(2) > 0 \Rightarrow$

$$m^2 - 8m - 48 > 0 \Rightarrow \quad -4 \quad 12 \quad (+ \mid - \mid +)$$

-12×4

$$(1) \cap (2) \cap (3) = -6 < m < -4 \Rightarrow \boxed{m = (-6, -4)}$$

Arman

سوال ۳) $3x^2+(2m-1)x+2-m=0$

$\alpha+\beta=-\frac{b}{a} \qquad \alpha\beta=\frac{c}{a}$

$-\frac{b}{a}=\frac{a}{c} \Rightarrow a^2=-bc \qquad 9=(1-2m)\times(2-m) \Rightarrow$

$9=2-5m+2m^2 \Rightarrow$

$2m^2-5m-7=0$

$-7+2=-5$

$m \to -1$

$\to \frac{7}{2}=3.5$

[illegible]

$3x^2+(2\times 3.5-1)x+2-3.5=0$ (6, -1.5)

$m=3.5 \Rightarrow \Delta>0$

$m=3.5$

$3x^2+(2\times -1-1)x+2+1=0$ (-3, 3)

$\Delta=9-4(3)(3)<0 \Rightarrow m\neq -1$

سوال ۴) $x^2-x-4=0 \to S=1 \quad P=-4$

$\alpha^3+\frac{1}{\beta}, \quad \beta^3+\frac{1}{\alpha}$

$(\alpha^3+\frac{1}{\beta})(\beta^3+\frac{1}{\alpha})=(\alpha\beta)^3+\frac{1}{\alpha\beta}+\beta^2+\alpha^2=(-4)^3+\frac{-1}{4}+$

$\alpha^2+\beta^2=S^2-2P \leftarrow 1-(2)(-4)$

$=-64+\frac{-1}{4}+1+8=-55-\frac{1}{4}=-(55+\frac{1}{4})=-\frac{221}{4}=P'$

$\alpha^3+\frac{1}{\beta}+\beta^3+\frac{1}{\alpha}=\underbrace{1-3(-4)(1)}_{S^3-3PS=\alpha^3+\beta^3}+\frac{\alpha+\beta}{\alpha\beta}=13+\frac{-1}{4}=\frac{51}{4}=S'$

$y=x^2-Sx+P \Rightarrow y=x^2-\frac{51}{4}x-\frac{221}{4} \Rightarrow 4y=4x^2-51x-221$

سوال ۲) ۲

$$x\sqrt[3]{x} - \sqrt[3]{x^2} + 1 - \frac{1}{\sqrt[3]{x^2}} + \sqrt[3]{x^2} - 1 = 2\sqrt[3]{x}$$

$$\frac{x^2-1}{\sqrt[3]{x^2}} = 2\sqrt[3]{x} \Rightarrow x^2-1 = 2x \Rightarrow x^2-2x-1 = 0$$

$$\Rightarrow S = x_1 + x_2 = \boxed{2}$$

Arman

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سوال ۶ (۳)

α , ۳α

$۹(۳\alpha^۲ - a\alpha + ۴ = ۰)$

$۲۷\alpha^۲ - ۳a\alpha + ۴ = ۰$

$-۶a\alpha + ۳۲ = ۰ \Rightarrow a\alpha = \frac{۳۲}{۶} \Rightarrow$

$a\alpha = \frac{۱۶}{۳}$

$۳\alpha^۲ - \frac{۱۶}{۳} + ۴ = ۰$

$\Rightarrow ۳^۲\alpha^۲ = \frac{+۴}{۳^۳} \Rightarrow \alpha^۲ = \frac{۴}{۹} \Rightarrow \alpha = \pm \frac{۲}{۳}$

$۳x^۲ - ax + ۴ = ۰ \longrightarrow$

$\left.\begin{array}{l} \alpha = \frac{۲}{۳} \\ \beta = ۳\alpha = ۲ \end{array}\right\} \Rightarrow S = \frac{۸}{۳} \quad P = \frac{۴}{۳}$

$\frac{+a}{۳} = \frac{۸}{۳} \Rightarrow a = ۸$

$\left.\begin{array}{l} \alpha = \frac{-۲}{۳} \\ \beta = -۲ \end{array}\right\} \Rightarrow P = \frac{۴}{۳} \quad S = -\frac{۸}{۳} \Rightarrow \frac{a}{۳} = \frac{-۸}{۳} \rightarrow a = -۸$

$\Rightarrow$ اختلاف $a_۱$ و $a_۲$ $= ۱۶$

سوال ۸)

(۲)

$x_0 = \frac{-a}{۲}$ $\qquad x = \frac{۲}{-۲} = -۱$ ← معادله محور تقارن سهمی دوم

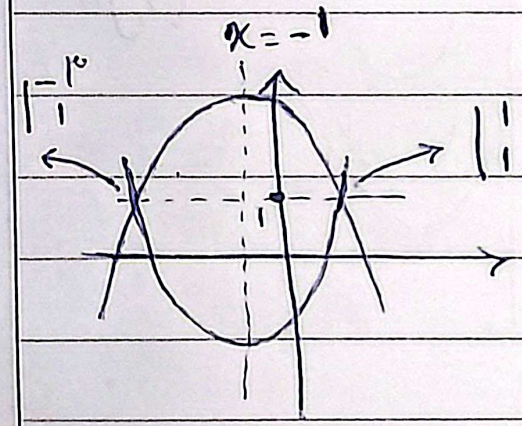
$\frac{-a}{۲} = -۱ \Rightarrow a = ۲$

$۱ = -x^۲ - ۲x + b \Rightarrow b = x^۲ + ۲x + ۱$

$۱ = x^۲ + ۲x - ۲$

$x^۲ + ۲x - ۳ = ۰$

$\Rightarrow x = \begin{cases} ۱ \\ -۳ \end{cases}$



$y = x^۲ + ax - ۲ \Rightarrow a = ۲$

$y = -x^۲ - ۲x + b \Rightarrow$

$۱ = -۱ - ۲ + b \Rightarrow b = ۴$

$ab = ۲ \times ۴ = \boxed{۸}$

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سوال ۱۹

$2ax^2 + ax - 4 = 0 \longrightarrow \alpha, \beta \quad : S = \frac{-a}{2} = \alpha + \beta$

$2x^2 - ax + b = 0 \longrightarrow \alpha + 0/a, \beta + 0/a \quad \therefore S = \alpha + \beta + 1 =$

$\frac{-a}{2} + 1$

$S = \frac{+a}{2}$

$\Rightarrow \frac{a}{2} = \frac{-a}{2} + 1 \Rightarrow a = 1$

$2x^2 - x + b = 0 \longrightarrow P' = (\alpha + 0/a)(\beta + 0/a) = \alpha\beta +$

$0/a(\beta + \alpha) + \frac{1}{4} = P + \frac{S}{2} + \frac{1}{4}$

$\Rightarrow P' = -2 - \frac{1}{4} + \frac{1}{4} = -2 \Rightarrow \frac{b}{2} = -2 \Rightarrow b = -4$

$2x^2 + x - 4 = 0 \longrightarrow \alpha\beta = P = \frac{-4}{2} = -2 \quad S = -0/a$

$\left[\frac{ab}{2}\right] = \left[\frac{-4 \times 1}{2}\right] = [-1/a] = -2$

[illegible]

سوال ۱۰) ⑤

$x^2+6x+m=0 \quad : \quad S=-6 \quad P=m$

$x^2+2x-3m=0 \quad : \quad S=-2 \quad P=-3m$

$\alpha+\beta=-6 \quad \alpha\beta=m$

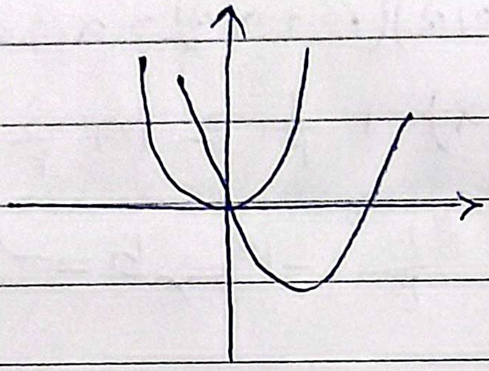
$-$

$\alpha+\theta=-2 \quad \alpha\theta=-3m$

$\beta-\theta=-6+2=-4$

اختلاف دو ریشه غیرمشترک = ④

سوال ۱۷) ②



$c=0$

$ax^2+(3+2a)x=0$

$\Rightarrow \Delta=(3+2a)^2=0$

$\Rightarrow 3+2a=0 \Rightarrow 2a=-3 \Rightarrow a=-1.5$

غلط ← زیرا $a<0$ ولی در حالت رسم شده $a>0$ باید باشد

$\Delta>0 \Rightarrow (3+2a)^2>0 \Rightarrow$ ② $a>0$

طبق شرط

$(a>0)$ ①

$b<0 \Rightarrow 3+2a<0 \Rightarrow 2a<-3 \Rightarrow a<-1.5$

$① \cap ② = \varnothing$

به ازای هیچ مقدار a