۱.

$y=ax^2+bx+c \longrightarrow y=a(x-h)^2+9 \Rightarrow 1=a(3+1)^2+9$

$x_s=-1 \qquad x-h=0 \longrightarrow x=h \longrightarrow h=-1$

$y_s=9 \Rightarrow \boxed{y=\frac{-1}{2}(x+1)^2+9}$

$16a+9=1$

$16a=-8$

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

۲.

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

$(+)(+) \to 2$ ✓ $\qquad (-)(0) \to 1$

$(+)(-) \to 1 \qquad (+) \to 1$

$(-)(-) \to 0 \qquad (-) \to 0$

$(+)(0) \to 2$

$\Delta>0 \to b^2-4ac=m^2-4(m+6)(2)=m^2-8m-48$

$m^2-8m-48>0 \longleftarrow (m-12)(m+4)>0$

$\frac{-b}{a}>0 \to \frac{-m}{2}>0 \to m<0$ ①

$\frac{c}{a}>0 \to \frac{m+6}{2}>0 \to m+6>0 \to m>-6$ ②

	-4		12	
$+$		$-$		$+$

$m>12,\ m<-4$ ③

$①\cap②\cap③\cap④ \Rightarrow \boxed{-6<m<-4}$

۳.

$3x^2+(2m-1)x+2-m=0$

$\Delta>0 \to (2m-1)^2-4(2-m)(3)=4m^2-4m+1-24+12m=4m^2+8m-23>0$

$\frac{-b}{a}=\frac{a}{c} \to \frac{+1-2m}{3}=\frac{3}{2-m} \Rightarrow 9=2-4m-m+2m^2 \to 2m^2-5m-7=0$

$m \begin{cases} -1 \ ✗ \text{ غیرقابل قبول} \\ +\frac{7}{2} \ ✓ \end{cases}$

(۱−) چون در رابطه بالا قرار دهیم برقرار نیست

ولی $\frac{7}{2}$ برقرار است

$\boxed{m=\frac{7}{2}}$

۴.

$x=x^2-4 \longrightarrow x^2-x-4=0$

$\frac{-b}{a}=\frac{+1}{1}=1 \qquad \frac{c}{a}=\frac{-4}{1}=-4$

$\frac{-b}{a}=x_2^3+\frac{1}{x_1}+x_1^3+\frac{1}{x_2}=(x_1+x_2)^3-3x_1x_2(x_1+x_2)+\frac{x_2+x_1}{x_1x_2}=1^3+12-\frac{1}{4}=\boxed{12.75}$

$\frac{c}{a}=x_1^2x_2^2+x_2^2+x_1^2+\frac{1}{x_1x_2}=(-4)^2+(x_1+x_2)^2-2x_1x_2+\frac{1}{-4}=-64+1+8-\frac{1}{4}$

فرض $a=1$

$-55-\frac{1}{4}=\boxed{-55.25}$

$\boxed{y=x^2-12.75x-55.25}$

۵.

$\left(\sqrt[3]{x^2}+\frac{1}{\sqrt[3]{x^2}}+1\right)\left(\sqrt[3]{x^2}-1\right)=2\sqrt[3]{x} \qquad \sqrt[3]{x}=t$

$\left(t^2+\frac{1}{t^2}+1\right)(t^2-1)=2t \Rightarrow t^4+1+t^2-t^2-\frac{1}{t^2}-1=t^4-\frac{1}{t^2}=2t$

$t^6-1=2t^3 \to t^6-2t^3-1=0 \longrightarrow x^2-2x-1=0$

$x \begin{cases} 1+\sqrt{2} \\ 1-\sqrt{2} \end{cases}$

$1+\sqrt{2}+1-\sqrt{2}=②$

ماه‌سینا امین الرعایا

Subject:

Year: Month: Day:

page: ( ) ریشه‌ها $x, 3x_1 = x_2$

6.

$3x^2 - ax + 4 = 0$

$\frac{-b}{a} = \frac{+a}{3} \to 3x + x = 4x = \frac{a}{3} \to x_1 = \frac{a}{12}$

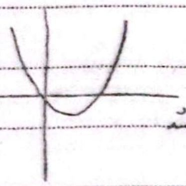
$\frac{c}{a} = \frac{4}{3} \to x \times 3x = 3x_1^2 = \frac{4}{3} \to 3\left(\frac{a}{12}\right)^2 = \frac{4}{3} \to 3 \times \frac{a^2}{144} = \frac{4}{3} \to a^2 = 64 \to a = \pm 8$

$|8 - (-8)| = (16)$

7.

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

$\frac{-b}{a} \geq 0 \Rightarrow \frac{-3 - 2a}{a} \geq 0$ ($-\frac{3}{2}$, 0)



$c = 0$ از مبدأ گذر

باید $a > 0$ باشد ①

$-\frac{3}{2}$		0	
$-$	$+$		$-$

$\Rightarrow -\frac{3}{2} \leq a < 0$ ②

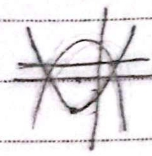
$① \cap ② = \varnothing$

8.

$y = ax^2 + ax - 2$

$y = -x^2 - 2x + b$

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



$y = 1$

$(1, 1) ; (-3, 1)$

$\Rightarrow 1 = -9 + 9 + b \Rightarrow 4 = b$

$ab = 2 \times 4 = (8)$

9.

$2x^2 - ax + b = 0 \to \frac{-b}{a} = \frac{+a}{2} = \frac{-a + 2a}{2a} \Rightarrow \frac{a}{2} = \frac{a}{2a} \to \frac{a}{2} = \frac{1}{2}$

$a = 1$

$2ax^2 + ax - 9 = 0 \to \frac{-b}{a} = \frac{-a}{2a}$

↓ $2x^2 + x - 9 = 0$

$x^2 + x - 12 = 0 \to (x - 3)(x + 4) = 0$ جاگذاری $x < \frac{3}{2}, -2$

ریشه‌های معادله اول $\to 2, -\frac{3}{2}$

$8 - 2 + b = 0 \to b = -6$

$\left[\frac{ab}{4}\right] = \left[\frac{-6}{4}\right] = (-2)$

10.

$x^2 + 9x + m = 0 \to x_1, x_2$ $\frac{-b}{a} = \frac{-9}{1} = -9 = x_1 + x_2$

$x^2 + 2x - 3m = 0 \to x_1, x_3$ $\frac{-b}{a} = -2 = x_1 + x_3$

$|x_1 + x_2 - (x_1 + x_3)| = |-9 + 2| \to |x_2 - x_3| = |-4| = (4)$