نام و نام خانوادگی: رادمهری — شماره کلاسی: تکلیف ۱۳ — ۱۸٫۵ — کلاس: سه‌شنبه‌ها ترم ۵ B دختر یازدهم

۱-

$\frac{-b}{2a}=2$ $\quad y=(a-1)x^2+x+3$

$\frac{-1}{2(a-1)}=2 \to -1=4a-4 \to a=\frac{3}{4} \to -\frac{1}{4}x^2+x+3=0$

$\Delta=1-4\times-\frac{1}{4}\times 3=4$

$\frac{-1\pm\sqrt{4}}{2\times-\frac{1}{4}}$ $\xrightarrow{+}$ $x=2$ غ ق ق ؛ $\xrightarrow{-}$ $x=6$ ق ق

۲-

$f(x)=mx^2-5x+m$

x		x_1		x_2	
$f(x)$	+	0	+	0	−

① $x<0$ ← چون بین دو ریشه ذکاف [illegible] علامت

② $\Delta>0 \to +25-4m^2>0 \to -\frac{5}{4}<m<\frac{5}{4}$

① ∩ ② $= \boxed{-\frac{5}{2}<m<0}$

۳-

$y=ax^2+bx+c \to a(x^2-Sx+P)=0$

$S=\frac{3-\sqrt{5}}{3}+\frac{3+\sqrt{5}}{3}=\frac{6}{3}=2$

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

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

۴-

$2x^2-8x+m+2=0 \qquad \alpha<\beta \qquad 3\alpha^2+\beta^2=12$

$P=\alpha\beta=\frac{m+2}{2}$

$S=\alpha+\beta=\frac{8}{2}=4 \to \beta=4-\alpha \to \beta^2=(4-\alpha)^2$

$\to 3\alpha^2+(4-\alpha)^2=3\alpha^2+16+\alpha^2-8\alpha=12$

$\to 4a^2-8\alpha+16=12 \to \alpha^2-2\alpha+1=0$

$\to (a-1)^2=0 \to \boxed{a=1}$

$\to \alpha+\beta=4 \to \beta=3$

$\to \frac{m+2}{2}=\alpha\beta \to m+2=6 \to \boxed{m=4}$

۵-

$S\begin{vmatrix}2\\9\end{vmatrix} \quad C=5 \quad y=a(x-h)^2+k \to y=a(x-2)^2+9 \to -x^2+4x+5$

$\hookrightarrow \begin{vmatrix}0\\5\end{vmatrix} \to 5=a(-2)^2+9 \to 4a=-4 \to a=-1$

	-1		5	
−		+		−

$\Rightarrow \boxed{(-1, 5)}$

-۷

$ax^2 - 7x + 9\beta = 0$

$P = \alpha\beta = \frac{9\beta}{\alpha} \rightarrow a = \frac{9}{\alpha} \rightarrow \alpha - \frac{9}{\alpha} = 0 \rightarrow \frac{\alpha^2 - 9}{\alpha} = 0 \rightarrow \alpha = \pm 3$

$\rightarrow a = +3 \rightarrow 3 + \beta = \frac{7}{3} \Rightarrow \beta = -\frac{2}{3}\alpha$

$\rightarrow a = -3 \rightarrow -3 + \beta = \frac{-7}{3} \rightarrow \beta = \frac{2}{3}$ ✓

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{-3} + \frac{1}{\frac{2}{3}} = -\frac{1}{3} + \frac{3}{2} = \boxed{\frac{7}{6}}$

2

-۸

$x^2 + mx - 2m = 0 \quad , \quad \alpha^2 - m\beta = 8$

$\beta^2 - 2m = -m\beta \rightarrow \alpha^2 + \beta^2 - 2m = 8 \rightarrow m^2 + 4m - 2m = 8 \rightarrow m^2 + 2m - 8 = 0 \rightarrow (m+4)(m-2) = 0$

$m = 2$, $\cancel{m = -4}$

$\Delta > 0$ ✓   غ ق ق $\Delta < 0$ ✗

$\alpha^2 + \beta^2 = s^2 - 2p = m^2 + 4m$

$s = -m$

$p = -2m$

$s = 4$ ✗ , -2 ✓

1/5

-۸

$f(x) = mx^2 + 4x + \frac{m}{2} + 7 \rightarrow -2x^2 + 4x + 6 = 0 \Rightarrow x^2 - 2x - 3 = 0 \; \langle \; -1, +3$

$\frac{+14 - 4m(\frac{m}{2} + 7)}{4m} = -8 \rightarrow 14 - 2m^2 - 28m = -32m$

$2m^2 - 4m - 16 = 0$

$m^2 - 2m - 8 = 0$

$(m-4)(m+2) = 0 \; \langle$ غ ق ق , -2 ✓

$\Delta > 0 \rightarrow 14 - 2m^2 - 28m \rightarrow m = 4 \rightarrow \Delta < 0$, $-2 \rightarrow \Delta > 0$

$\boxed{x = 3}$

2

-۹

$y = a(x-2)^2 + 6 \xrightarrow{10} 4 = a(4) + 6 \Rightarrow a = -\frac{1}{2} \rightarrow y = -\frac{1}{2}(x^2 - 4x + 4) + 6$

↳ $x^2 - 4x - 8$

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

1

-۱۰

$x^2 - (4a+4)x + (3a^2 + 6a + 3) = 0$

$x = 2 \rightarrow 4 - 8a - 8 + 3a^2 + 6a + 3 = 0 \rightarrow 3a^2 - 2a - 1 = 0 \; \langle \; 1, -\frac{1}{3}$

$\Delta > 0 \rightarrow (4a+4)^2 - 4(3a^2 + 6a + 3) > 0 \; \langle \; a = 1 \rightarrow \Delta > 0$, $a = -\frac{1}{3} \rightarrow \Delta > 0$

$\Rightarrow a = 1 \rightarrow x^2 - 8x + 12 = 0 \; \langle \; 2, 6$

$\rightarrow a = -\frac{1}{3} \rightarrow x^2 - \frac{8}{3}x + \frac{4}{3} \rightarrow 3x^2 - 8x + 4 = 0 \; \langle \; 2, \frac{2}{3}$

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