۱۹,۵

نام و نام خانوادگی ......کریم امیران...... پاسخنامه تشریحی تکلیف شماره ...۱۳... کلاس ....A..........

1

$y=(a-1)x^2+x+3$

راس $x=-\frac{b}{2a}=2=-\frac{1}{2(a-1)}=4a-4=-1 \rightarrow \boxed{a=\frac{3}{4}}$

$y=(\frac{3}{4}-1)x^2+x+3=-\frac{1}{4}x^2+x+3 \xrightarrow{y=0} -\frac{1}{4}x^2+x+3=0 \rightarrow x^2-4x-12=0$

$\rightarrow x=\frac{4\pm 8}{2} \rightarrow x_1=6$ قق ، $x_2=-2$ غ قق $\rightarrow \boxed{x_1=6}$

۲

2

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

$\Delta=(-5)^2-4m^2=25-4m^2 \xrightarrow{\Delta>0} 25-4m^2>0 \rightarrow 4m^2<25 \rightarrow |m|<\frac{5}{2} \xrightarrow[m<0]{\text{چون}} -\frac{5}{2}<m<0$

$\rightarrow \boxed{-\frac{5}{2}<m<0}$

	$-\frac{5}{2}$		$+\frac{5}{2}$	
$-$		$+$		$-$

۲

3

$x_1=\frac{3+\sqrt{5}}{3}$, $x_2=\frac{3-\sqrt{5}}{3} \rightarrow x^2-(x_1+x_2)x+x_1x_2=0$

$\rightarrow x_1+x_2=2$, $x_1x_2=\frac{4}{9} \rightarrow x^2-2x+\frac{4}{9}=0 \xrightarrow{\times 9} \boxed{9x^2-18x+4=0}$

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4

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

$3\alpha^2+\beta^2=12 \rightarrow 3\alpha^2+(4-\alpha)^2=12 \rightarrow 4a^2-8a+4=0 \xrightarrow{\div 4} a^2-2a+1=0 \rightarrow (a-1)^2=0 \rightarrow \boxed{a=1}$

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

آنگاه $\beta=4-\alpha=3 \rightarrow \alpha<\beta$ برقرار

$\alpha\beta=\frac{c}{a}=\frac{m+2}{2} \rightarrow \alpha\beta=1\times 3=3=\frac{m+2}{2}=m+2=6 \rightarrow \boxed{m=4}$

۲

راس $\rightarrow (2,9) \rightarrow (h,k)$

ریشه اول $=x_1=5$

$y=a(x-h)^2+k \rightarrow y=a(x-2)^2+9 \rightarrow -(x-2)^2+9 \rightarrow x-2=\pm 3 \rightarrow x_1=-1$, $x_2=5$

برای $x=5 \rightarrow a(5-2)^2+9=0 \rightarrow 9a+9=0 \rightarrow \boxed{a=-1}$

$\rightarrow \boxed{-1<x<5 \text{ یا } (-1,5)}$

۲

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

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

$x_1 + x_2 = -\frac{b}{a} \rightsquigarrow \frac{7}{a}$

$x_1 x_2 = \frac{c}{a} \rightsquigarrow \frac{9\beta}{a} \to \alpha\beta = \frac{9\beta}{a} = \alpha^2 = 9 \to a = \pm 3$ ~ قابل قبول + $\to a = -3$, $\beta = \frac{2}{3}$ ۲ ۶

$x^2 + mx - 2m = 0$ ۱,۵

$a^2 - m\beta = 8$

$a + \beta = -m \to m = -(a+\beta) \xrightarrow{\text{جایگذاری}} a^2 - (-(a+\beta))\beta = 8 \to a^2 + \beta(a+\beta) = 8 \to a^2 + a\beta + \beta^2 = 8$ ۷

$\alpha\beta = -2m$

$\to (\alpha+\beta)^2 = \alpha^2 + 2\alpha\beta + \beta^2 \rightsquigarrow (a+\beta)^2 - a\beta = 8 \to (-m)^2 - (-2m) = 8 \to m^2 + 2m - 8 = 0$

$\hookrightarrow m = \frac{-2 \pm 6}{2} \to m_1 = 2,\ m_2 = -4 \to a + \beta = \boxed{-m} \to -2,\ 4$

$m = 2 \to \Delta > 0$ ✓

$m = -4 \to \Delta < 0$ ✗

$S = -m = -2$

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

راس، $x = -\frac{b}{2a} \to \frac{-4}{2m} = -\frac{2}{m} = k \to f(k) = 8 \to f(-\frac{2}{m}) = m(\frac{4}{m^2}) + 4(-\frac{2}{m}) + \frac{m}{2} + 7$ ۲

$\to \frac{4}{m} - \frac{8}{m} + \frac{m}{2} + 7 \to f(-\frac{2}{m}) = -\frac{4}{m} + \frac{m}{2} + 7 = 8 \to -\frac{4}{m} + \frac{m}{2} = 1 \to -8 + m^2 = 2m \to m^2 - 2m - 8 = 0$ ۸

$m = \frac{2 \pm \sqrt{4+32}}{2} = \frac{2 \pm 6}{2} \to$ ۴ غقق ✗ ، $\to -2$ قق ✓ $\to f(x) = -2x^2 + 4x + 6 \to x = -1, 3 \rightsquigarrow \boxed{K = 1}$

چون سهمی رو به سمت پایین است ضریب m منفی است

$f(x) = a(x-2)^2 + 6 \xrightarrow{(0,4)} 4 = a(0-2)^2 + 6 = 4 = 4a + 6 \to \boxed{a = -\frac{1}{2}}$

$f(x) = -\frac{1}{2}(x-2)^2 + 6 \xrightarrow{f(x)=0} -\frac{1}{2}(x-2)^2 + 6 = 0 \to (x-2)^2 = 12 \to x - 2 = \pm 2\sqrt{3} \to x_1 = 2 - 2\sqrt{3},\ x_2 = 2 + 2\sqrt{3}$

$\to \frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1 + x_2}{x_1 x_2} = \frac{2 + 2\sqrt{3} + 2 - 2\sqrt{3}}{4 - 12} = \frac{4}{-8} = \boxed{-\frac{1}{2}}$ ۲ ۹

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

$\to x_1 + x_2 = 4a + 4 \xrightarrow{x_1 = 2} 2 + x_2 = 4a + 4 \to x_2 = 4a + 2$

$x_1 x_2 = 3a^2 + 6a + 3 \qquad 2(4a+2) = 3a^2 + 6a + 3 \to 8a + 4 = 3a^2 + 6a + 3 \to 3a^2 + 6a + 3 - 8a - 4 = 0$

$\to 3a^2 - 2a - 1 = 0 \to \frac{2 \pm \sqrt{4+12}}{6} \to a_1 = 1 \rightsquigarrow x_2 = 6$ ، $a_2 = -\frac{1}{3} \rightsquigarrow x_2 = \frac{2}{3}$ → ریشه دیگر می‌تواند $\to 6,\ \frac{2}{3}$ ۲ ۱۰