سیمسا متفرع داگهان   دهم‌ریاضی B کیلشب

1)

$x^2-5x+2=0$

ریشه‌ها α, β

$\alpha\beta=2$

$\beta=\frac{2}{\alpha}$

$\alpha+\beta=5$

$$\frac{4\alpha+\beta^5}{5\beta^2}=\underbrace{\frac{4\alpha}{5\beta^2}}_{\frac{4}{\alpha^2}}+\frac{\beta^3}{5}$$

$$\frac{\alpha^3}{5}+\frac{\beta^3}{5}=\frac{\alpha^3+\beta^3}{5}=\frac{(\alpha+\beta)^3-3\alpha\beta(\alpha+\beta)}{5}=\frac{(5)^3-3\times(2)(5)}{5}=19$$

2)

$\frac{-b}{a}=?\ 1.5$

$\begin{vmatrix}-1.5\\-4\end{vmatrix}\quad \begin{vmatrix}3\\-4\end{vmatrix}\quad \begin{vmatrix}2\end{vmatrix}$

$$\frac{-b}{2a}=\frac{3-1.5}{2}\Rightarrow\frac{-b}{\cancel{2}a}=\frac{1.5}{\cancel{2}}$$

3)

$x^2+2kx+5=0$

$$\frac{\sqrt{\Delta}}{|a|}=\frac{4}{3}k\Rightarrow\left(\frac{\sqrt{4k^2-4\times5\times1}}{1}\right)^2=\left(\frac{4}{3}k\right)^2\Rightarrow 4k^2-20=\frac{16}{9}k^2$$

$\frac{20}{9}k^2=20$

$k^2=9$

$\left[\frac{k^2}{2}\right]\Rightarrow\left[\underbrace{\frac{9}{2}}_{4.5}\right]=4$

4)

$\begin{vmatrix}3\\y\end{vmatrix}\quad\begin{vmatrix}-5\\y\end{vmatrix}\quad \frac{-\Delta}{4a}=1\quad \begin{vmatrix}-1\\1\end{vmatrix}\to$ (راس)

$\alpha^2+\beta^2=5 \quad c=?$

$(\alpha+\beta)^2-2\alpha\beta=5$

$4-2\alpha\beta=5$

$\alpha\beta=-\frac{1}{2}\sim\frac{c}{a}$

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

$$\frac{-b}{2a}=\frac{3-5}{2}\Rightarrow\frac{-b}{2a}=-1$$

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

$y=a\left(x^2+2x-\frac{1}{2}\right)=$

$1=a\left(\underbrace{1-2}_{-1}-\frac{1}{2}\right)$

$-\frac{3}{2}a=1$

$a=-\frac{2}{3}\Rightarrow c=-\frac{2}{3}\times-\frac{1}{2}=+\frac{1}{3}$

5)

$-x^2+5x+m=0$

$\alpha, \beta<\frac{9}{2}$

	α		β	
$-$		$+$		$-$

$\Delta>0$, $a<0$

$25-4\times-1\times m>0$

$25+4m>0\Rightarrow m>\frac{-25}{4}$

$x=\frac{9}{2}\Rightarrow-\left(\frac{9}{2}\right)^2+5\times\frac{9}{2}+m<0$

$-\frac{81}{4}+\frac{45}{2}+m<0$

$m<\frac{-9}{4}$

$-\frac{9}{4}\quad-\frac{25}{4}$

$-\frac{25}{4}<m<\frac{-9}{4}\to \overbrace{-3,-4,-5,-6}^{4\text{ تا}}$

6)

$y=\overset{3}{m}x^2-12x+\overbrace{5m-1}^{14}$

$\min y=2$

$\frac{-b}{2a}=?$

$\frac{-\Delta}{4a}=2$

$$\frac{-144+4\times m(5m-1)}{4m}=2\Rightarrow-144+20m^2-4m=8m$$

$\div 4:\ 20m^2-12m-144=0$

$5m^2-3m-36=0$

$$\frac{-b\pm\sqrt{\Delta}}{2a}=\frac{3\pm\sqrt{9-4\times5\times(-36)}}{2a}\quad 729$$

$$\frac{3\pm 27}{10}=3,\ -\frac{24}{10}=-\frac{12}{5}$$

$m>0$

$m=3$

$y=3x^2-12x+14$

$x=\frac{12}{6}=2$

17)

$\alpha, \beta \qquad x^2 + 2(a+1)x + 2a - 1 = 0$

$\beta = a\alpha$

$\frac{2a-1}{1} = \alpha\beta = a^2$

$2a - 1 = a^2 \Rightarrow a^2 - 2a + 1 = 0 \qquad (a-1)^2 = 0$

$a = 1$

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18)

$x^4 - 7x^2 - 5 = 0 \qquad t = x^2 \Rightarrow t^2 - 7t - 5 = 0$

$2p^2 - 3Sp + 3S = ?$

$t = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{7 \pm \sqrt{49+20}}{2} = \frac{7 \pm \sqrt{69}}{2}$

$\sqrt{t} = \sqrt{7 \pm \sqrt{69}} \rightsquigarrow$ غیرقابل قبول $= 0 = S$

$2 \times (7+\sqrt{69})^2$

$= \frac{2 \times (49 + 69 + 14\sqrt{69})}{118} = 59 + 7\sqrt{69} \qquad \sqrt{7+\sqrt{69}} \times \sqrt{7+\sqrt{69}} = \sqrt{(7+\sqrt{69})^2} = \frac{7+\sqrt{69}}{2} = p$

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19)

$y = kx^2 - 4x - 6 \Rightarrow S \left| \begin{matrix} \frac{-b}{2a} \\ \frac{-\Delta}{4a} \end{matrix} \right. \Rightarrow S \left| \begin{matrix} \frac{2}{k} \\ \frac{-(16+24k)}{4k} \end{matrix} \right. \Rightarrow S \left| \begin{matrix} \frac{2k}{} \\ \frac{-4-6k}{k} \end{matrix} \right.$

$-4\left(\frac{2}{k}\right) - 4 = -\frac{8+4k}{k} \Rightarrow \frac{-8-4k}{k} = -\frac{4-6k}{k}$

$-\frac{4-2k}{k} = 0 \Rightarrow 2k - 4 = 0 \Rightarrow k = 2 \Rightarrow \frac{-4-6k}{k} = \frac{-4-12}{2} = -8$

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10)

$-mx^2 + mx + 1 = -m - x$

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

$\Delta > 0 \Rightarrow \cancel{(m+1)^2} - 4 \times m(1-m) > 0$

$5m^2 + 6m + 1 > 0 \leftarrow +m^2 + 1 + 2m + 4m + 4m^2 > 0$

$(m+1)(5m+1) > 0$

-1		$-\frac{1}{5}$	
$+$	$-$		$+$

$m \in (-1, -\frac{1}{5})$

غیرقابل قبول