1. A point P moves on $xy-$plane such that $PS+PS'=4$, where $S(K,\ 0)$ and $S'(-K,\ 0)$, then which of the following is not true about the locus of P ?

(1) Ellipse if $K\in(-2,\ 2)$
(2) Line segment if $K=\pm2$
(3) Empty if $K\in(-\infty,\ -2)\cup(2,\ \infty)$
(4) None of these

2. The equation $\left|\sqrt{x^2+(y-1)^2}-\sqrt{x^2+(y+1)^2}\right|=$ K will represent a hyperbola for -

(1) $K\in\ (0,\ 2)$
(2) $K\in\ (0,\ 1)$
(3) $K\in\ (1,\ \infty)$
(4) $K\in\ (0,\ \infty)$

3. If a directrix of a hyperbola centered at the origin and passing through the point $\left(4,-2\sqrt{3}\right)$ is $5x=4\sqrt{5}$ and its eccentricity is e, then:

(1) $4e^4+8e^2-35=0$
(2) $4e^4-24e^2+35=0$
(3) $4e^4-24e^2+27=0$
(4) $4e^4-12e^2-27=0$

4. The ellipse $E_1:\frac{x^2}{9}+\frac{y^2}{4}=1$ is inscribed in a rectangle R whose sides are parallel to the coordinate axes. Another ellipse E_2 passing through the point $(0,4)$ circumscribes the rectangle R. The length (in units) of the major axis of ellipse E_2 is

5. A hyperbola having the transverse axis of length 1 unit is confocal with the ellipse $3x^2+4y^2=12$. The square of length of conjugate axis of hyperbola is__

6. If the eccentricity and length of latus rectum of a hyperbola are $\frac{\sqrt{13}}{3}$ and $\frac{10}{3}$ units respectively, then find the length of the transverse axis.

7. Let LL' be the latus rectum through the focus of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and A be the farther vertex. If $\Delta ALL'$ is equilateral, then the eccentricity of the hyperbola is (axes are coordinate axes)

(1) $\sqrt{3}$
(2) $\sqrt{3}+1$
(3) $\frac{\sqrt{3}+1}{\sqrt{2}}$
(4) $\frac{\sqrt{3}+1}{\sqrt{3}}$

8. If S and $S'$are the foci of the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ and if PSP' is a focal chord with $SP=8$ then $SS'=$

(1) $4+S'P$
(2) $S'P-1$
(3) $4+SP$
(4) $SP-1$

9. A chord is drawn passing through $P(2,\ 2)$ on the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ such that it intersects the ellipse at points A and B. Then the maximum value of $PA\cdot PB$ is equal to

(1) $\frac{61}{4}$
(2) $\frac{59}{4}$
(3) $\frac{71}{4}$
(4) $\frac{63}{4}$

10. If $(a\sec\theta,b\tan\theta)$ & $(a\sec\phi,b\tan\phi)$ be the coordinates of the ends of a focal chord passing through$(ae,\ 0)$ of $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$, then $\tan\frac{\theta}{2}\ \tan\frac{\phi}{2}$ equals to

(1) $\frac{e-1}{e+1}$
(2) $\frac{1-e}{1+e}$
(3) $\frac{1+e}{1-e}$
(4) $\frac{e+1}{e-1}$