WORKSHEET ELLIPSE

1. The center of an ellipse is $C(2, 4)$ and has major axis parallel to x-axis with the length 26 cm. If the length of the minor axis is 10 cm then find the coordinates of the vertices and foci, eccentricity and equation of the ellipse.
2. The center of an ellipse is $C(1, 3)$ and has major axis parallel to y-axis with the length 8 cm. If the length of the minor axis is 4 cm then find the coordinates of the vertices and foci, eccentricity and equation of the ellipse.
3. The equation of an ellipse is $x^2 + 4y^2 - 6x - 16y + 21 = 0$. What is the coordinates of its vertices, foci and center.

4. What are the positions of the following lines with respect to the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$.
   a. $y = 3x - 4$ b. $y = x + 7$ c. $4x - 5y + 25 = 0$
5. If the line $y = 3x + k$ and the ellipse $x^2 + \frac{y^2}{16}=1$ doesn't intersect then what are the value of k?
6. If the line $y = 2x + 4$ is tangent to the ellipse $\frac{x^2}{4}+\frac{y^2}{b^2}=1$ then what is the value of b?
7. If the line $2x - y + k = 0$ is tangent to the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$ then what is the value of k?
8. If the line $x + 2y = p$ cut the ellipse $x^2 + 4y^2 = 16$ at two different points then what is the value of p?

9. Find the equation of the tangent and normal lines of the ellipse $x^2 + 4y^2 = 4$ from the point $P(\sqrt{3}, \frac{1}{2})$.
10. Find the equation of the tangent and normal lines of the ellipse $4x^2 + 6y^2 = 70$ from the point P(2, 3).
11. Find the equation of the tangent and normal which passes through the point $P(1, 6\sqrt{3})$ on the ellipse $144x^2 + 4y^2 = 576$.