**3D Gradients of an Ellipse**

1. Find the equation of the tangent to the ellipse with equation at the point
2. Show that the equation of the normal to the ellipse with equation at the point is

Notes on tangents and normals to an ellipse

1. The point lies on the ellipse with parametric equations   
   .
2. Find the value of at the point .
3. Find the equation of the normal to the ellipse at point .
4. Show that the condition for to be a tangent to the ellipse is
5. The ellipse has the equation . The line is normal to the ellipse at the point and passes through the point , where cuts the -axis, as shown in the diagram.

Find the exact coordinates of the point , where cuts the positive-axis.

