**3E Gradients of a Hyperbola**

1. Find the equation of the tangent to the hyperbola with equation at the point
2. Prove that the equation of a tangent to the hyperbola at the point is
3. Show that an equation of the normal to the hyperbola with equation at is .
4. Show that the condition for the line to be a tangent to the hyperbola is that and satisfy
5. The tangent to the hyperbola with equation at the point crosses the -axis at the point . Find the value of .
6. The hyperbola has equation .

The line is the tangent to at the point . The line passes through the origin and is perpendicular to The lines and intersect at the point .

Show that the coordinates of the point are .