Hyperbola Problem Three

(1) Find an equation of the line tangent to the hyperbola \( \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \) at the point \((x_0, y_0)\) on the hyperbola.

(2) What is the limiting behavior of the hyperbola’s tangent lines as the magnitude of \(x_0\) and \(y_0\) approaches \(\pm\infty\)?