1. Sketch the curves of intersection of \( z = e^x \cos y \) with the planes \( x = -1, x = 0, \) and \( x = 1 \).

2. Sketch the curves of intersection of \( z = e^x \cos y \) with the planes \( y = 0, y = \frac{\pi}{6}, \) and \( y = \frac{\pi}{2} \).
3. The curve of intersection of $z = e^x \cos y$ with the plane $x = 1$ has tangent line $\mathbf{r}(t) = \langle 1, t, e \rangle$ at the point $(1, 0, e)$. Find an equation for the tangent line to the curve of intersection of $z = e^x \cos y$ with the plane $y = 0$ at the point $(1, 0, e)$.

4. The two tangent lines you found in the previous problem determine a plane called the \textit{tangent plane} to the surface $z = e^x \cos y$. Find an equation for this plane.