1. Given the curve
   \[ \mathbf{r}_1(t) = (8 \cos(t), 6t, 8 \sin(t)), \]
   
   (a) Calculate the length of the curve from \( t = 0 \) to \( t = \pi \).

   (b) Find an arc-length parametrization for this curve.
2. Find the equation of a plane that is parallel to $x + 3y + z = 0$ and goes through the point $(2, 3, 4)$. 