PROBLEM:

The Euler and inverse Euler formulas can often simplify a messy complex formula.

(a) Evaluate: $(\cos(\pi/3) + j\sin(\pi/3))^3$. Give the answer in rectangular form.

(b) Simplify the following expression

$$z(t) = \frac{e^{j\omega t} - e^{-j\omega t}}{e^{j\omega t} + e^{-j\omega t}}$$

by giving a simple formula for the magnitude and phase of $z(t)$.