PROBLEM:

Simplify the following complex-valued expressions. Give your answer in either rectangular or polar form, whichever is most convenient. In parts (a)-(d) assume that A, α, and ϕ are positive real numbers. Your answers to parts (a)-(d) will be in terms of these quantities.

(a) For $z = Ae^{-j\pi/3}$, determine a simple expression for $\Re e\{z^*\}$.

(b) For $z = Ae^{-j\pi/3}$, determine a simple expression for $z - z^*$.

(c) For $z = 10e^{j\phi}$, determine a simple expression for $\Im m\{jz\}$.

(d) For $z = \alpha - j\alpha$, determine a simple expression for z in polar form.

(e) For $z = Ae^{-j\pi/3}$, determine a simple expression for $|z|/z$ in polar form.