PROBLEM:

Simplify the following complex-valued expressions. Give your answer in either rectangular or polar form, whichever is most convenient.

(a) For $z = 5e^{j\pi/4}$, evaluate $\Im m\{z^*\}$.

(b) For $z = 13e^{-j\pi/4}$, evaluate $|z|/z$.

(c) For $z = 5e^{j\pi/4}$, evaluate $\Re e\{jz\}$.

(d) For $z = -2 - j2$, give z in polar form.

(e) For $z = 2e^{j\pi/4}$, evaluate $1/z$.

(f) For $z = (1 - j)/\sqrt{2}$, evaluate $\Im\{z^{16}\}$.

(g) For $z_1 = (-1 - j)/\sqrt{2}$ and $z_2 = e^{-j\pi/4}$, evaluate $z_3 = z_1 + z_2$ and $z_4 = z_1 z_2$ plot all four complex numbers in the complex plane.