Exercises on complex numbers
Introduction to Knowledge Engineering, Department of Knowledge Engineering

1. Let $z = 3 + 4i$.
   a. Find Re z and Im z.
   b. Find $\bar{z}$
   c. Find $|z|$
2. Let $z = 3 + 4i$ and $w = 2 - i$. Compute:
   a. $z + w$, $z - w$, $z + \bar{w}$, $\overline{z + w}$
   b. zw
   c. $\frac{z}{w}$
3. Compute real and imaginary part of $z = \frac{i-4}{-3+2i}$
4. Compute the absolute value and the conjugate of $w = i^{17}$
5. Find all complex numbers satisfying the given equation.
   a. $(1 + 2i)z + 3 + 4i = 0$
   b. $z + \bar{z} = 6$
6. Prove that there is no complex number z such that $|z| - z = i$
7. Let $z = \sqrt{2} + \sqrt{2}i$ and $w = -i$.
   a. Express z and w in trigonometric form and plot them in the complex plane.
   b. Compute zw and $\frac{z}{w}$ by using z and w in trigonometric form. Express the results in algebraic form.

Success!