1. Evaluate
   (a) \((2 + i)(3 - i)\)
   (b) \((3 + 2i)^2\)
   (c) \(\frac{z + i}{3 - i}\)

2. Find all of the cube roots of \(i\).

3. Evaluate
   (a) \(\sin i\)
   (b) \(\cos e^{i\pi/4}\)
   (c) \(\ln(3 - i)\)

   Indicate which branch cut was made, if necessary.

4. Is the function \(f(z) = \bar{z}\) analytic? Explain.

5. Let \(\Gamma\) be the semicircle of radius 2 centered at the origin from \(-2i\) to \(2i\) in the half-plane \(\text{Re } z > 0\).
   Parametrize the curve and evaluate \(\int_{\Gamma} \bar{z} \, dz\) directly.

6. For the function \(f(z) = \frac{z}{(z^2 + 1)\sin z}\), find all of the singularities. Determine which are poles, and find the order of each pole. Find the residue at each pole.

7. Use residues to evaluate the integral \(\int_{0}^{\infty} \frac{dx}{x^4 + 1}\)