1. Write the following complex numbers in standard form \( a + ib \).

   (a) \((2 + i)(3 + 4i)\)  
   (b) \((1 + 2i)^4\)  
   (c) \(\frac{1+i}{2+3i}\)  
   (d) \(\frac{i+a}{i-a}\) where \(a\) is a real number

2. Problem 1.4 page 14.

3. Problem 1.5 page 14.

4. Find all complex solutions (written in standard form) of the following equations.

   (a) \(2z^2 + 2z + 5 = 0\)  
   (b) \(5z^2 + 4z + 1 = 0\)  
   (c) \(z^2 + 2z + 1 - i = 0\)  
   (d) \(z^4 = z\)  
   (e) \(z^4 - z^2 + 4 = 0\)  
   (f) \(z^6 - z^3 - 2 = 0\)

5. Problem 1.23 (a), (c), (d), (h) page 16.

6. Sketch the following sets on the complex plane.

   (a) \(0 \leq \arg z \leq \frac{\pi}{4}\)  
   (b) \(\text{Re}(z^2) > 0\)  
   (c) \(0 < |z - 1| < 2\)  
   (d) \(|z| \leq |z - 4|\)