Homework 1
Due 4/10/2019

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) $\mathrm{Re}(z^2) > 0$

   (c) $0 < |z - 1| < 2$

   (d) $|z| \leq |z - 4|$