MATH 120: Using Polar Form of Complex Numbers

1. Put the following polar form complex numbers into rectangular form:

$$6e^{7\pi i/6} \qquad 5e^{8\pi/9} \qquad \frac{1}{2}e^{i}$$

2. Put the following rectangular numbers into polar form with positive modulus and argument between 0 and 2π:

$$5-5i \qquad 3+4i \qquad -6+i$$

3. Do the previous problem again using an argument between $-\pi$ and π and negative modulus.

4. Compute the following

$$(5-5i)^3 \qquad (3+4i)^4 \qquad (-6+i)^{-2}$$

Give your answers in rectangular form.

5. Compute the following

$$\sqrt[3]{5-5i} \qquad \sqrt[4]{3+4i} \qquad (-6+i)^{3/2}$$

Give your answers in rectangular form.

6. Find all solutions to the following

$$x^7+1=0 \qquad x^3+i=0 \qquad x^4-5ix^2-4=0$$

7. Factor completely

$$x^4-16i \qquad -ix^3+1 \qquad x^7-x^4-x^3+1$$