

# Math 416 Complex variables

## Problem Set 8

Due: November 5 in class

1. Find the Taylor series expansion of the following functions:

(i)  $z \cos(z^2)$  around the origin

(ii)  $\frac{z}{z^2+9}$  around the origin

(iii)  $\frac{1}{1-z}$  around  $i$

2. Find the Laurent series expansion of the function

$$f(z) = \frac{1}{z^2} \cos\left(\frac{1}{z^2}\right)$$

in the region  $|z| > 0$ .

3. Find the Laurent expansions for the function

$$f(z) = \frac{1}{z(1-z^2)}$$

around the origin.

Do the following exercises from the text book:

4. Page 188, Question 4

5. Page 188, Question 9

6. Page 197, Question 8

7. Page 206, Question 8