APPM 5430 HOMEWORK #2

Assigned Wed. Sept. 11, 2019

DUE AT CLASS MONDAY Sept. 30, 2019

Chapter 2

2.4 i) use the set up and the parameterization of 2.1 problem 1 to evaluate $\int_C f(z)dz$ where $f(z) = \frac{z^2+1}{z^3}$ and C is the unit circle

2.4 (con't) 2e, 6, 9

2.5 i) use the set up of p 2.5 problem 1 to evaluate $\int_C f(z)dz$ where C is the unit circle and $a) f(z) = \cos z$, and b) $f(z) = \frac{1}{\sqrt{z-ia}}$, $a > 1$

2.6 2e, 3, 5, 7

Chapter 3

3.1 3

3.2 2e,f, 7, 11

3.3 7

Additional Problems 3.3:

1.Given the function

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

Expand $f(z)$ in a Laurent series in the regions

$$(a)\ |z| < 1 \quad (b)\ 1 < |z| < 2 \quad (c)\ |z| > 2$$

2. Let

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

Find the Laurent series for $|z| > 1$ corresponding to a branch of $f(z)$.