APPM 4360/5360 Introduction to Complex Variables and Applications

HOMEWORK #6

Assigned: Monday March 18, 2019

DUE: At class Monday April 8, 2019

XC: Extra Credit

1. Evaluate the integral $\frac{1}{2\pi i}\oint_C f(z)dz$ where C is a unit circle centered at the origin and $f(z)$ is given below

$a)\ \frac{z^3}{z^4+a^4},\ 0<a<1$; b) $\frac{\log(z-b)}{z^2+a^2},\ 0<a<1, b>1,$ principal branch, c)$\tan 2z$

2. 4.1.2 a

3. 4.1.4 a,b

4. Determine the type of singular point each of the following functions have at infinity

a) $\frac{z^n}{z^m+a}, a>0$ $n>m$ positive integers; b) $\log(z^2+a^2), a>0$; c) $\cos z$

5. Solve: 4.1.7

6. Evaluate the following real integral: $\int_0^\infty \frac{x^2}{(x^2+\beta^2)^2}dx, \beta>0$

7. Solve: 4.2.2 b, d

8. Solve: 4.2.4

9. Solve 4.2.5

10. Solve 4.2.7

(XC) Solve 4.2.6