

Mth 611 Assignment 3 | Name:

Bent Petersen 611s2005-003.tex Due date: Wed May 25, 2005 17:10

Instructions: Please supply your solution(s) by the due date in the space provided below. Continue on to the back of the sheet if you need more space. Do not turn in any additional paper. For additional comments and instructions check my webpage <http://oregonstate.edu/~peterseb>

Problem 3.1 Let F be a rational function of two real variables such that $F(x, y) \neq 0$ when $x^2 + y^2 = 1$. Substitute $z = e^{i\theta}$ to write

$$\int_0^{2\pi} F(\cos \theta, \sin \theta) \, d\theta$$

as a contour integral

$$\int_{|z|=1} G(z) \, dz.$$

Problem 3.2 Use the result of the previous problem, partial fractions and the Principle of the Argument, or the Cauchy formula, to evaluate the integral

$$\int_0^{2\pi} \frac{d\theta}{a + \sin \theta}.$$

where a is real and $a > 1$.