

University of Toronto at Scarborough
Department of Computer & Mathematical Sciences

TEST 2

MATC34H – Complex Variables

Examiner: J. Friedlander

Date: October 23, 2007

1. Show that if a and b are constants then

$$u(x, y) = ax + by$$

is a harmonic function and find its harmonic conjugates.

2. State the Cauchy–Riemann equations and describe their relationship to analytic functions.

3. Evaluate

$$\int_{|z|=1} \frac{dz}{z(z-2)}.$$

Hint: Cauchy's theorem will help.