Department of Mathematics
Christopher Newport University

Math 355-01 **Complex Variables** *Spring Term 2007*

Homework # 7

Due Friday March 23, 2007

1. Evaluate each integral, where the the path is any contour between the indicated limits of integration:

(a) $\displaystyle\int_i^{\pi+i} \sin(\frac{z}{2})\, dz$

(b) $\displaystyle\int_0^i z\, e^z\, dz$

2. Do problem # 4 on page 133.

3. Let C be the lower half of the circle centered at the origin with radius 2, and with positive orientation. Evlauate

$$\int_C \frac{1}{z}\, dz$$

Use the following branch of $\log z$

$$\log z = \ln r + i\,\theta \qquad (r > 0,\ \frac{\pi}{2} < \theta < \frac{5\pi}{2})$$

4. Let C be the unit circle centered at the origin with positive orientation (counterclockwise). Evaluate each integral (Hint: Use partial fractions.)

(a) $\displaystyle\int_C \frac{1}{z\,(z+2)}\, dz$

(b) $\displaystyle\int_C \frac{1}{z^2\,(z+2)}\, dz$