

HOMEWORK 7, DUE FRIDAY, MARCH 28

Please turn in solutions for the following problems:

- (1) Let  $C$  be the positively oriented boundary of the square with corners at  $2 + 2i$ ,  $2 - 2i$ ,  $-2 + 2i$ , and  $-2 - 2i$ . Evaluate each integral:

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

(b)  $\int_C \frac{\cos(z)}{z(z^2 + 8)} dz$

(c)  $\int_C \frac{e^{3z}}{z^4} dz$

- (2) Let  $C$  be the closed upper-right quarter-circle of radius 2, positively oriented. That is,  $C$  consists of the line segment from 0 to 2, the circular arc of radius 2 from 2 to  $2i$ , and the line segment from  $2i$  to 0. Evaluate:

$$\int_C \frac{1}{z^4 + 1} dz.$$

(Hint: To factor, you'll need to compute the square roots of  $i$ .)

- (3) Let  $C$  be the circle  $|z - i| = 2$ , positively oriented. Evaluate each integral:

(a)  $\int_C \frac{1}{z^2 + 4} dz$

(b)  $\int_C \frac{1}{(z^2 + 4)^2} dz$

In addition, I suggest that you work these problems from the Brown/Churchill textbook (but do not turn in):

- Pages 160-161, problems 1, 2
- Pages 170-171, problems 1, 3, 4