Complex Variables / MAT 3223.001

Midterm 3 / April 22, 1998 / Instructor: D. Gokhman

Name: _____

Please show all work and box the answers, where appropriate.

1. (40 pts.) Evaluate integrals (a–c) around the unit circle and integral (d) along the straight line segment from the origin to $1 + i$.

$$\text{(a)} \int \frac{dz}{z^2 + 2z} \qquad \text{(b)} \int \frac{dz}{z^3 + 2z^2} \qquad \text{(c)} \int |z|\,|dz| \qquad \text{(d)} \int \operatorname{Im} z\,dz$$

2. (20 pts.) Let $p(z) = z^4 + 3z - 1$.

(a) Show that all four zeros of p lie in the disk $|z| < 2$.

(b) Show that exactly one zero of p lies in the unit disk.

1(a-b)	1(c-d)	2	total (60)	%