MATH410

Midterm #1, 03/10/16

Total 100

Show all work legibly.   **Name**:_____

1. (25) Let b and c be real numbers. Suppose $z_1 = 1+i$ is a root of the quadratic equation $z^2+bz+c = 0$.

   - (20) Find the second root z_2.

$z_2 =$

- (5) Determine b and c.

$b =$ $c =$

2. (25) Let D be a set of complex numbers z that satisfy

$$|z - 1| \leq 1 \text{ and } |z + 1| \leq 1.$$

True or False? The set D is star–shaped.

Mark one and explain.

□ True   □ False

3. (25) Suppose that $\sum_{n=1}^{\infty} z_n$ converges. True or False? $\lim_{n \to \infty} z_n = 0$.

Mark one and explain.

□ True □ False

4. (25) Suppose that the sequence $\{w_n\}$ converges. Let $|z| < 1$. True or False? The series $\displaystyle\sum_{n=1}^{\infty} w_n z^n$ converges.

Mark one and explain.

☐ True   ☐ False