

**Problems - Sections 30 and 31**

(2c) Compute  $\log(-1 + i\sqrt{3})$ .

(3b) Show that  $\text{Log}(-1 + i)^2 = 2\text{Log}(-1 + i)$  is false, where  $\text{Log}$  uses the principal branch.

(10) Show in two ways that  $\ln(x^2 + y^2)$  is harmonic in domains which don't contain the origin: by verifying Laplace's equation, and by finding an analytic function where  $u = \ln(x^2 + y^2)$ .