

## Math 379 H1

*Question 1.* Express each in the polar form.

a)  $2 - 2\sqrt{3}i$

b)  $(1 - i)^{-1}$

c)  $(1 + \sqrt{3}i)^3$

d)  $\frac{\sqrt{3}-i}{(1+i)}$

*Question 2.* Let  $z, w \in \mathbb{C}$ . Prove that

$$|z + iw|^2 + |w + iz|^2 = 2(|z|^2 + |w|^2).$$

*Question 3.* Find all the cube roots of  $\sqrt{2} + i\sqrt{2}$ .

*Question 4.* p.10, problem 1.6

*Question 5.* p.10, problem 1.10

*Question 6.* p.11, problem 1.13

*Question 7.* Give a complete computation (including the proof that  $K > 0$ ) showing that the circle of Apollonius is indeed a circle.