Complex Number Exercises
CS 145 Images and Imagination
Spring 2010

1. Put in z standard form (a + b i):

    a. $z = 4 + \sqrt{9}$ = _____

    b. $z = i^2 + i\sqrt{25}$ = _____

    c. $z = 254\ i^2$ = _____

    d. $z = i^7$ = _____

2. Convert from polar to standard form (Cartesian coordinates) in standard form

    a. $r = 4,\ \ \theta = 25,\ \ z =$ _____

    b. $r = 5,\ \ \theta = 165\ \ z =$ _____

3. Compute the modulus (length) of

    a. $z = 3 + 4i,\ \ \ \ r =$ _____

    b. $z = -2 + 1.6i,\ \ \ r =$ _____

4. What is the $\bar{z}$ = complex conjugate of each of the z values in problem 1

    a. $\bar{z}$ = _____

    b. $\bar{z}$ = _____

    c. $\bar{z}$ = _____

    d. $\bar{z}$ = _____

5. Suppose $z_1 = (4 + 3\ i)$ and $z_2 = (-2 + 4\ i)$. Calculate the following, placing the result in standard form

    a. $z_1 + z_2$ = _____

    b. $z_1 - z_2$ = _____

    c. $2\ z_1$ = _____

    d. $z_1\ z_1 = z_1^2 =$ _____

    e. $z_1\ z_2$ = _____

    f. $\bar{z}_1 + z_1$ = _____

    g. $\bar{z}_1 z_1$ = _____

    h. z_1 / z_2 = _____