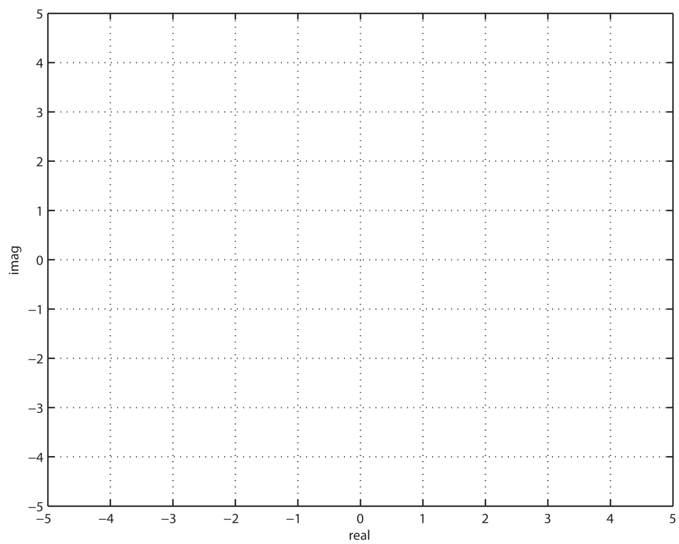
I. BASIC OPERATIONS WITH COMPLEX NUMBERS

For the following take $z_1 = 1 + j$ and $z_2 = 3 + 4j$.

1. Convert z_1 and z_2 to polar and exponential notation (find r, θ).

2. Plot z_1 and z_2 on the complex plane below.



3. Compute $z_1 + z_2$. Show it graphically on a plot in the complex plane from #2.

4. Compute $z_1 - z_2$. Show it graphically on a plot in the complex plane from #2

5. Compute $z_1 z_2$. If you finish quickly, repeat using a different notation.

6. Compute z_1/z_2. If you finish quickly, compute z_2/z_1 and compare.

7. Compute z_1^4

II. SOME PLOTS

For the following the complex numbers are given as a function of ω.

$$z_3 = \frac{1}{1+\omega j}$$

$$z_4 = \frac{\omega j}{1+\omega j}$$

1. Convert z_3 and z_4 to r, θ notation.

2. Plot the magnitude r of the two complex numbers, z_3 and z_4, as a function of ω on log-log scale. Let ω vary from 10^{-3} to 10^3.

3. Plot the angle θ of the two complex numbers, z_3 and z_4, as a function of ω on log-log scale.Let ω vary from 10^{-3} to 10^3.