1. Given that $z_1 = 1 - j2$ and $z_2 = 2 + j3$, compute $z_1 + z_2$, $z_1 - z_2$, $z_1 z_2$, and $\frac{z_1}{z_2}$. Express your answers in rectangular form.

2. Express each of the following complex numbers in rectangular and in exponential form:
   (a) $z_a = 5 \angle 45^\circ$
   (b) $z_b = 10 \angle 120^\circ$
   (c) $z_c = -15 \angle -90^\circ$
   (d) $z_d = -10 \angle 60^\circ$.

3. Simplify each of the following expressions to a complex number in rectangular form:
   (a) $z_a = 5 + j5 + 10 \angle 30^\circ$
   (b) $z_b = 5 \angle 45^\circ - j10$
   (c) $z_c = \frac{10 \angle 45^\circ}{3 + j4}$
   (d) $z_d = \frac{15}{5 \angle 90^\circ}$

4. Use MATLAB to solve the following three simultaneous equations:
   
   $$(14 + j6)I_1 - (1 + j2)I_2 - (12 + j2)I_3 = 150 + j86.6$$
   $$-(1 + j2)I_1 + (14 + j6)I_2 - (12 + j2)I_3 = -j173.2$$
   $$-(12 + j2)I_1 - (12 + j2)I_2 + (36 + j6)I_3 = 0$$

5. Find $a$, $b$, $A$, and $\theta$ (angles given in degrees).
   (a) $Ae^{j120^\circ} + jb = -4 + j3$
   (b) $6e^{j120^\circ} (-4 + jb + 8e^{j\theta}) = 18$
   (c) $(a + j4)j2 = 2 + Ae^{j60^\circ}$

Reading Assignment: Chapter 9