In this section we will see the relationship between complex numbers in rectangular form versus polar form versus exponential form. The objective for this section includes

- Represent a complex number in rectangular, polar, or exponential form

Convert each complex number from the given polar form of $r(\cos\theta + j\sin\theta)$ to exponential form of $re^{\theta j}$ where θ must be expressed in radians. Let's take a minute to show an example of exponential form (it is based on a proof in calculus):

$$2e^{5.6j}$$

1. $2(\cos 245° + j\sin 245°)$

2. $47.3 - 10.9j$

3. $5(\cos 135° + j\sin 135°)$

4. $6 + 2j$

Now convert backwards from exponential form to polar and rectangular form.

5. $2.50e^{3.84j}$

6. $5.83e^{-1.2j}$

Perform the indicated operations and express results in rectangular and polar forms.

7. $(2.35e^{1.46j})^3$

8. $(7.2e^{5.13j})(4.1e^{2.78j})$

9. The intensity of the signal from a radar microwave signal is
   $37.0\left[\cos(-65.3°)+j\sin(-65.3°)\right]$ V/m. Write this in exponential form.