

Physics 261

Homework # 11

Remember to show your work.

1. Convert to exponential form ($Ae^{j\theta}$):

- (a) j
- (b) -1
- (c) $-j - 1$
- (d) $2 - 5j$

2. Convert to rectangular form ($x + jy$):

- (a) $e^{j\pi}$
- (b) $\frac{1}{\sqrt{2}}e^{-3j\pi/4}$
- (c) $2e^{-j\pi/6}$

3. Simplify in rectangular form and then find the magnitude:

- (a) $(1 + 2j)^2$
- (b) $\frac{4-j}{j+5}$

4. Given $z_0 = a + jb$, $z_1 = c + jd$, where a, b, c, d are real numbers. Let

$$z_2 = z_1 - \frac{j}{z_0}.$$

- (a) Find $\text{Re}(z_2)$.
- (b) Find $\text{Im}(z_2)$.