Physics 360/Math 360 MWF 11:00 - 11:50 PM, Room: Dennis 231

Instructor: Michael Lerner, Dennis 221, Phone: 727-LERNERM

Assignment 2, Due Thursday Jan 30

Problem 1: Show that $e^{z_1}e^{z_2} = e^{z_1+z_2}$ via power series expansions.

Problem 2: Use graphical techniques to multiply $\left[6e^{i\pi}\right]\left[3e^{(3\pi/2)i)}\right]$.

Problem 3: Write the general form for the following two series, and determine the disks of convergence.

$$1 + iz + \frac{2(iz)^2}{2!} + \frac{3(iz)^3}{3!} + \ldots$$
$$1 + iz + \frac{(iz)^2}{2!} + \frac{(iz)^3}{3!} + \ldots .$$

Problem 4: (§2.10 15) Find all values of $\sqrt[6]{-64}$.

Problem 5: (§2.10 27,28) Using the fact that the complex equation is really two real equations, find the double angle formulas (for $\sin 2\theta$, $\cos 2\theta$) as well as the triple angle formulas (for $\sin 3\theta$, $\cos 3\theta$).

Problem 6: Find $e^{2+i\pi}$ in rectangular form.

Problem 7: Express the following integral in exponential form and then integrate $\int_{-\pi}^{\pi} \cos^2(2x)dx$.

Problem 8: Express the following in rectangular coordinates: 3^i, $(-1)^i$, $(2i)^{(i+1)}$.