Midterm 3 / April 29, 2005 / MAT 3223.001 / Functions of a complex variable

Name: _____

Please show all work and explain your answers.

1. Expand $z^5 e^{z^2}$ in a Taylor series at $z = 0$. What is the radius of convergence?
2. Expand $\dfrac{1}{z^2 - 4}$ in a Laurent series convergent in a punctured disc centered at -2. What is the annulus of convergence?
3. Find and classify all singularities of $\dfrac{z}{\sin z}$.
4. Suppose $f_n(z)$ is a sequence of entire functions which converges to z uniformly on $\mathbf{C}$. Prove that there exists n^* such that for all $n \geq n^*$ $f_n(z)$ is a polynomial of degree 1.

1	2	3	4	total (40)	%

Prelim. course grade: %