Math 444 - Homework 11 **Name:** _____

Find Taylor series for the following functions with the given centers.

1. $f(x) = \dfrac{\sin(z^3)}{z^2}$ centered at 0.

2. $f(x) = \dfrac{1}{z+2i}$ centered at 0.

3. $f(x) = \text{Log}(z+2i)$ centered at 0. Hint integrate the last Taylor series!

4. Use the Taylor series formula $f(z) = \sum_{n=0}^{\infty} \frac{f^{(n)}(c)}{n!}(z-c)^n$ to find the Taylor series for e^z centered at $c = \pi i$.

5. Use the ratio test to find the radius of convergence of the power series $\displaystyle\sum_{n=0}^{\infty} \frac{(z-i)^n}{(n+1)3^n}$.