Math 295 - Fall 2020
Warm up 10.1
Due before class on Monday November 16

Please turn in this assignment on Gradescope.

Problem 1 : Of importance this week will be the so-called **punctured disk** or **punctured ε-neighborhood**.

a) What notation does BMPS use for the punctured disk of radius R centered at z_0?

b) What notation does Bowman use for the punctured ε-neighborhood of z?

c) Are these two sets the same or different?

Problem 2 : Please read Proposition 9.8 of BMPS (page 132), and for each of the following functions, say if f has a removable singularity, a pole (and if so, the order of the pole), or an essential singularity at z_0. You may assume that the singularity at z_0 is isolated in each case.

a) $f(z) = \displaystyle\sum_{k=0}^{\infty} \frac{(z-z_0)^{-k}}{k!}$

b) $f(z) = \displaystyle\sum_{k=0}^{\infty} \frac{(-1)^k (z-z_0)^{2k-3}}{(2k)!}$

c) $f(z) = \displaystyle\sum_{k=0}^{\infty} (z-z_0)^k$