

MTH 317/617

Quiz #8

1. For the function

$$f(z) = \frac{e^{z^2}}{2+z}$$

find the first three nonzero terms in the Taylor series about $z_0 = 0$ and determine the radius of convergence.

$$\begin{aligned} \frac{e^{z^2}}{2+z} &= \frac{e^{z^2}}{2(1+\frac{z}{2})} = \frac{(1+z^2+\frac{1}{2}z^4+\dots)}{2} \left(1 - \frac{z}{2} + \frac{z^2}{4} + \dots\right) \\ &= \frac{1}{2} - \frac{z}{4} + \frac{5z^2}{8} + \dots \end{aligned}$$

The radius of convergence is 2.