SOLUTION TO QUIZ 3

MATH 241

Find the radius of convergence of the power series

$$\sum_{k=1}^{\infty} \frac{(k!)^2(3+4i)^k}{(2k)!}(z-i)^k$$

Proof. By root test, $\frac{a_{k+1}}{a_k} = \frac{(3+4i)(k+1)^2}{(2k+2)(2k+1)}$, so $\lim_{k\to\infty} |\frac{a_{k+1}}{a_k}| = |\frac{3+4i}{4}| = \frac{5}{4}$, therefore the radius of convergence is $\frac{4}{5}$. □