Power Series: <u>Taylor Series</u>

<u>Corollary</u> to previous results:

Suppose $\sum_{n=0}^{\infty} c_n (z-a)^n$ has radius of cvgce R, and γ is a (piecewise smooth) path in the disk $D = \{ z \mid |z-a| < R \}$. Then

$$\int_\gamma \left(\sum_{n=0}^{\infty} c_n (z-a)^n \right) dz = \sum_{n=0}^{\infty} \left(\int_\gamma c_n (z-a)^n dz \right).$$

Note that it follows that if γ is closed, then $\int_\gamma \left(\sum_{n=0}^{\infty} c_n (z-a)^n \right) dz = 0$.

<u>Thm:</u> Suppose $f(z) = \sum_{n=0}^{\infty} c_n (z-a)^n$ has radius of cvgce. $R > 0$. Then $f(z)$ is holomorphic in the (open) disk $D = \{ z \mid |z-a| < R \}$.