<u>Prop:</u> Suppose $f(z) = \sum_{n=0}^{\infty} c_n (z-a)^n$ has radius of cvgce. $R > 0$. Then
$$c_n = \frac{f^{(n)}(a)}{n!} \quad \text{for all } n \geq 0.$$

[This is Taylor's formula.]

<u>proof:</u> $f(a) = c_0 \Rightarrow c_0 = \frac{f^{(0)}(a)}{0!}$ as $0! = 1$

$f'(a) = f^{(1)}(a) = 1 \cdot c_1 \Rightarrow c_1 = \frac{f^{(1)}(a)}{1!}$ as $1! = 1$

$\vdots$

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<u>Corollary:</u> If $\sum_{n=0}^{\infty} c_n (z-a)^n$ & $\sum_{n=0}^{\infty} d_n (z-a)^n$ both converge to the same function on some open disk centred at a, then $c_n = d_n$ for all a.