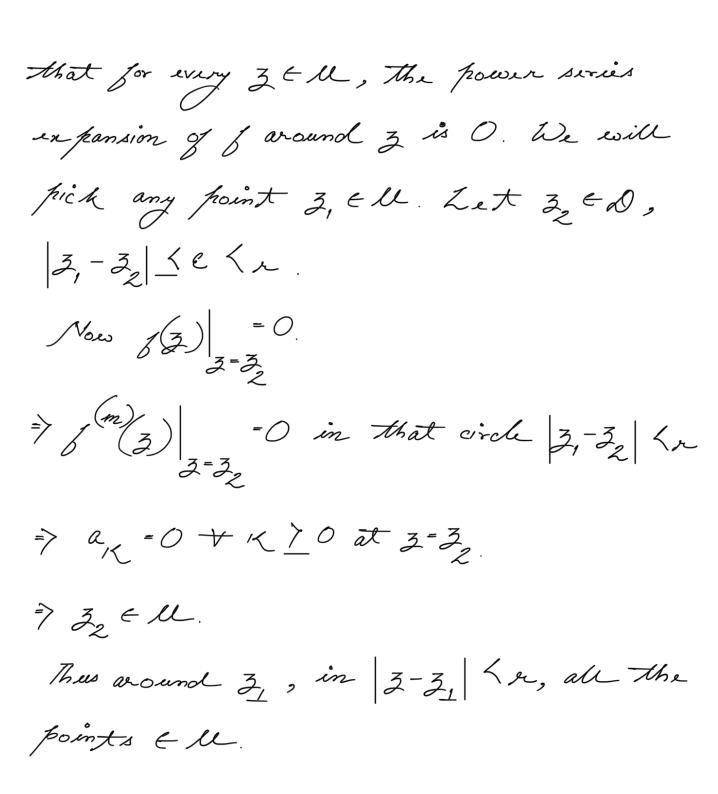
Zerois of an Analytic Function Let I be an analytic function on D and 8(30) =0, 3 & D. We say that zo is a zero of  $\int g \text{ order } n \text{ } j \text{ } \lim_{3 \to 3_0} \frac{\int(3)}{\left(3-\frac{3}{2}\right)^{n-1}} = 0 \text{ and}$ 

 $\lim_{3\to 3_0} \frac{b(3)}{(3-3_0)^n} \neq 0.$ 

Any analytic function fon Dis either O everywhere on D on the zeroes of of are isolated.

Let  $J(3_0) = 0$  for some  $3_0 \in \emptyset$ . In the neighbour hood of  $3_0$ , 8(3) = \sum a\_K (3-3) \langle where |3-30| \r. ax =0 + K > 0.

Let Il be the set of all points in D, such



(2) Lets choose any random point  $3_3 \in D \setminus U$ and  $a_K \neq 0$  for some K. We will pick a point  $3_4$  from the neighbourhood of  $3_3$ .  $\delta(3_4) = \sum_{k=1}^{\infty} a_k(3-3_3)^{\frac{k}{3-3}}$  K>0 2=2

The first non zero term,  $b_{\mathcal{K}}\left(3-3_{3}\right)^{\mathcal{K}}$  will dominate the sum of the remaining terms. So  $\int \left(3_{4}\right)^{\frac{1}{2}} 0$ .

=> D\U is an open set

=> D = U / (D\U)

disjoint

> U = or D since Dis connected.

When M = D, f(z) = 0 everywhere on D.

And when M = 0, the zeroes of f are isolated.