DERET TAYLOR DAN DERET LAURENT

Oleh : Danang Mursita

Matematika untuk Perguruan Tinggi - http://www.biobses.com/judul-buku,300-matematika_untuk_perguruan_tinggi.html

Materi yang dibahas pada bab adalah Deret Taylor, Deret Laurent dan Perderetan menggunakan fungsi pada MatLab.

Definisi dasar deret fungsi kompleks secara esensi sama seperti deret fungsi real, termasuk pengertian mengenai deret pangkat atau deret kuasa. Pembahasan dari deret kuasa pada bilangan kompleks dikemukakan oleh Taylor dan Laurent.

15.1. Deret Taylor

Misal fungsi f(z) analitik pada $|z - z_0| < R_0$ (lingkaran dengan pusat di z_0 dan jari-jari R_0), maka untuk setiap titik z pada lingkaran itu, f(z) dapat dinyatakan sebagai:

$$f(z) = \sum_{n=0}^{\infty} a_n (z - z_0)^n \ldots\ldots (|z - z_0| < R_0) \qquad (15.1)$$

dengan $a_n = \frac{f^{(n)}(z_0)}{n!} \ldots\ldots (n = 0,1,2,\ldots)$

Atau dituliskan,

$$f(z) = f(z_0) + \frac{f'(z_0)}{1!}(z - z_0) + \frac{f''(z_0)}{2!}(z - z_0)^2 + \ldots (|z - z_0| < R_0). \qquad (15.2)$$

Deret (15.1) dan (15.2) disebut **Deret (Polinomial) Taylor** di titik z_0 dan daerah $|z - z_0| < R_0$ disebut **daerah kekonvergenan** atau **daerah**

keanalitikan deret. Bila f(z) fungsi entire (fungsi analitik dimana-mana) maka daerah keanalitikan deret yaitu: $|z - z_0| < \infty$.

Bila $z_0 = 0$, maka deret disebut **Deret Mac laurin** dan dapat dituliskan:

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