MATERI :

Barisan.

BARISAN:

Barisan tak hingga $\{u_n\} = u_1, u_2, u_3, u_4, \ldots\ldots\ldots u_n \ldots\ldots\ldots\ldots\ldots$

Adalah fungsi-fungsi dari variable n terbatas pada kumpulan bilangan – bilangan bulat positif.

Contoh-contoh :

1). $\left\{\frac{1}{n+1}\right\} = \frac{1}{2}, \frac{1}{3}, \frac{1}{4} \ldots\ldots\ldots\ldots$

2). $\left\{\frac{3n^2}{n^2+1}\right\} = \frac{3}{8}, \frac{12}{29}, \frac{27}{64}, \ldots\ldots\ldots\ldots\ldots\ldots\ldots$

3) . $\left\{\frac{n^2}{n+1}\right\} = \frac{1}{2}, \frac{4}{3}, \frac{9}{4}, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$

Konvergensi Barisan

Barisan $\{u_n\}$ disebut konvergen ke L jika $\lim_{n\to\infty} u_n = L$

Artinya untuk setiap bilangan positip ε, terdapat bilangan positip N sehingga $n \geq N \rightarrow |u_n| < \varepsilon$,

Barisan yang tidak konvergen disebut divergen.

Contoh – contoh :

1. $\left\{\frac{3n^2}{n^2+1}\right\}, konvergen ke. \frac{3}{7},.$

2. $\left\{\frac{\ln(n)}{e^n}\right\}. konvergen ke: 0$

Karena $\lim_{n\to\infty} \frac{\ln(n)}{e^n} = \lim_{n\to\infty} \frac{1/n}{e^n} = \frac{1/\infty}{e^\infty} = 0$

3. $\left\{\frac{n^2}{2^n}\right\}$, *konvergen ke* 0,.

4. $\left\{e^{-n}\cos n\right\}$ *konvergen ke* : 0

$$\lim_{n\to\infty}\frac{\cos(n)}{e^n}=\frac{\cos\infty}{e^\infty}=0$$

5. $\left\{\frac{n}{n+1}(2-\frac{1}{n^2})\right\}$. *konvergen ke* : 2

Karena $\lim_{n\to\infty}\left\{\frac{n}{n+1}(2-\frac{1}{n^2})\right\}.=\lim_{n\to\infty}\left\{\frac{n}{n+1}(\frac{2n^2-1}{n^2}\right\}=\lim_{n\to\infty}\frac{2n^3-n}{n^3+n^2}=2$

6. $\left\{n\sin\frac{\pi}{n}\right\}$. *konvergen ke* : π

Karena : $\lim_{n\to\infty}\left\{n\sin\frac{\pi}{n}\right\}.=\lim_{n\to\infty}\frac{\sin\pi/n}{1/n}=\lim_{n\to\infty}\frac{-\frac{\pi}{n^2}\cos\pi/n}{-1/n^2}=\pi\cos\frac{\pi}{\infty}=\pi$

TUGAS:

Tentukan lima suku pertama barisan dan Selidiki konvergensi barisan berikut :

1. $\left\{\frac{n^3}{e^n}\right\}$

2. $\left\{\frac{\ln(1/n)}{\sqrt{n}}\right\}$

3. $\{n^2 - n\}$

4. $\left\{\frac{e^n}{n^2}\right\}$

5. $\left\{\frac{3n^2+2}{n^2+4n+5}\right\}$

LINK**INTERNAL**

LINK EKSTERNAL

LINK DOKUMEN :

- Murray R. Spiqel JR, KALKULUS LANJUTAN, , Erlangga , Jakarta 1991
- Purcel,E.J.," Calculus With Analytic Geometry, Prentice – Hall , Inc., 1994.