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Kelas : IF3A

1. Tentukan deret Taylor dan maclueron dari:

a. $f(x)=\dfrac{1}{1+x}$

b. $f(x)=\ln(1+x)$

2. Tentukan deret Taylor dan maclueron dari:

a. $f(x)=\sin x$

b. $f(x)=\cos x$

<div align="center">jawab</div>

1.a $f(x)=\dfrac{1}{1+x}$

deret taylor

$$1+\frac{\frac{d}{dx}(\frac{1}{1+x})(0)}{1!}x+\frac{\frac{d^2}{dx^2}(\frac{1}{1+x})(0)}{2!}x^2+\frac{\frac{d^3}{dx^3}(\frac{1}{1+x})(0)}{3!}x^3+...$$

deret maclaurin

$$1+\frac{\frac{d}{dx}(\frac{1}{1+x})(0)}{1!}x+\frac{\frac{d^2}{dx^2}(\frac{1}{1+x})(0)}{2!}x^2+\frac{\frac{d^3}{dx^3}(\frac{1}{1+x})(0)}{3!}x^3+...$$

1.b. $f(x)=\ln(1+x)$

deret taylor

$$f(0)=0+\frac{\frac{d}{dx}(\ln(1+x))(0)}{1!}x+\frac{\frac{d^2}{dx^2}(\ln(1+x))(0)}{2!}x^2+\frac{\frac{d^3}{dx^3}(\ln(1+x))(0)}{3!}x^3+...$$

deret maclaurin

$$f(0)=0+\frac{\frac{d}{dx}(\ln(1+x))(0)}{1!}x+\frac{\frac{d^2}{dx^2}(\ln(1+x))(0)}{2!}x^2+\frac{\frac{d^3}{dx^3}(\ln(1+x))(0)}{3!}x^3+...$$

2.a. $f(x)=\sin x$

$f(x)=\sin(x)\,dimana\,x_0=0$

$f(x)=\sin(x)=\sin(0)h\cos(0)-\dfrac{h^2}{2}\sin(0)-\dfrac{h^3}{6}\cos(0)$

$f(x)=\sin(x)=x-\dfrac{x^3}{6}+\dfrac{x^5}{120}-...$

2.b. $f(x)=\cos x$

$\cos x=1-\dfrac{1}{2!}x^2+\dfrac{1}{4!}x^4-\dfrac{1}{6!}x^6+\dfrac{1}{8!}x^8+...$