RANGKUMAN MATEMATIKA 2

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Sifat-Sifat Logaritma

Untuk suatu $a, b, c > 0$ dan $a \neq 1$ berlaku

a) ${}^a\log 1 = 0$

b) ${}^a\log a = 1$

c) ${}^a\log bc = {}^a\log b + {}^a\log c$

d) ${}^a\log \frac{b}{c} = {}^a\log b - {}^a\log c$

e) ${}^a\log b^r = r\,{}^a\log b$

f) ${}^a\log \frac{1}{c} = -\,{}^a\log c$

Eksponensial Natural

$$e = \lim_{x\to\infty}\left(1+\frac{1}{x}\right)^x \qquad \text{dan} \qquad e = \lim_{x\to 0}(1+x)^{\frac{1}{x}}$$

Teorema pada Turunan

Jika $u = f(x)$ dan $v = g(x)$, maka

1. $\dfrac{d}{dx}[uv] = u'v + v'u$
2. $\dfrac{d}{dx}\dfrac{u}{v} = \dfrac{u'v - v'u}{v^2}$ dengan $v \neq 0$
3. $\dfrac{d}{dx} = \dfrac{d}{du}\dfrac{du}{dx}$

Logaritma Natural

Untuk $x > 0$ berlaku

1. $\ln x = \displaystyle\int_1^x \frac{1}{t}\,dt$
2. $\dfrac{d}{dx}\ln x = \dfrac{1}{x}$

Turunan dan Integral Fungsi Eksponensial

1. $\dfrac{d}{dx}[e^x] = e^x$
2. $\dfrac{d}{dx}[a^x] = a^x \ln a$
3. $\displaystyle\int e^x\,dx = e^x + C$
4. $\displaystyle\int a^x\,dx = \frac{a^x}{\ln a}$

Turunan Fungsi Invers

1. $(f^{-1})'(x) = \dfrac{1}{f'(f^{-1}(x))}$
2. $\dfrac{dy}{dx} = \dfrac{1}{dx/dy}$

Turunan dan Integral Fungsi Invers Trigonometri

1. $\frac{d}{dx}[\sin^{-1}(x)] = \frac{1}{\sqrt{1-x^2}}$
2. $\frac{d}{dx}[\cos^{-1}(x)] = -\frac{1}{\sqrt{1-x^2}}$
3. $\frac{d}{dx}[\tan^{-1}(x)] = \frac{1}{1+x^2}$
4. $\frac{d}{dx}[\cot^{-1}(x)] = -\frac{1}{1+x^2}$
5. $\frac{d}{dx}[\sec^{-1}(x)] = \frac{1}{x\sqrt{x^2-1}}$
6. $\frac{d}{dx}[\csc^{-1}(x)] = -\frac{1}{x\sqrt{x^2-1}}$
7. $\int \frac{1}{\sqrt{1-x^2}}\,dx = [\sin^{-1}(x)] + C$
8. $\int \frac{1}{1+x^2}\,dx = [\tan^{-1}(x)] + C$
9. $\int \frac{1}{x\sqrt{x^2-1}}\,dx = [\sec^{-1}(x)] + C$