

KÉPLETGYŰJTEMÉNY

a Matematika A1 és A2 tantárgyak számonkéréseikhez
a BME-GTK nemzetközi gazdálkodás és pénzügy és számvitel alapszakos hallgatóinak

TRIGONOMETRIA:

$$\sin^2(x) + \cos^2(x) = 1$$

$$\sin(x \pm y) = \sin(x) \cos(y) \pm \cos(x) \sin(y)$$

$$\cos(x \pm y) = \cos(x) \cos(y) \mp \sin(x) \sin(y)$$

$$\sin(2x) = 2 \sin(x) \cos(x)$$

$$\cos(2x) = \cos^2(x) - \sin^2(x)$$

$$\sin^2(x) = \frac{1 - \cos(2x)}{2}$$

$$\cos^2(x) = \frac{1 + \cos(2x)}{2}$$

HIPERBOLIKUS FÜGGVÉNYEK:

$$\operatorname{sh}(x) = \frac{e^x - e^{-x}}{2}$$

$$\operatorname{ch}(x) = \frac{e^x + e^{-x}}{2}$$

$$\operatorname{th}(x) = \frac{\operatorname{sh}(x)}{\operatorname{ch}(x)}$$

$$\operatorname{ch}^2(x) - \operatorname{sh}^2(x) = 1$$

DERIVÁLÁSI SZABÁLYOK:

$$(c f(x))' = c f'(x), \quad (c \text{ konstans})$$

$$(f(x) + g(x))' = f'(x) + g'(x)$$

$$(f(x) g(x))' = f'(x) g(x) + f(x) g'(x)$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x)g(x) - f(x)g'(x)}{g^2(x)}$$

$$(f \circ g)'(x) = f'(g(x)) g'(x)$$

$$(x^n)' = n \cdot x^{n-1}$$

$$(e^x)' = e^x$$

$$(\sin(x))' = \cos(x)$$

$$(\operatorname{tg}(x))' = \frac{1}{\cos^2(x)}$$

$$(\operatorname{sh}(x))' = \operatorname{ch}(x)$$

$$(\ln(x))' = \frac{1}{x}$$

$$(\operatorname{arcsin}(x))' = \frac{1}{\sqrt{1-x^2}}$$

$$(\operatorname{arctg}(x))' = \frac{1}{1+x^2}$$

$$(\operatorname{arsh}(x))' = \frac{1}{\sqrt{1+x^2}}$$

$$(\operatorname{arth}(x))' = \frac{1}{1-x^2}, \quad |x| < 1$$

$$(a^x)' = \ln(a) \cdot a^x$$

$$(\cos(x))' = -\sin(x)$$

$$(\operatorname{ctg}(x))' = -\frac{1}{\sin^2(x)}$$

$$(\operatorname{ch}(x))' = \operatorname{sh}(x)$$

$$(\log_a(x))' = \frac{1}{x \ln(a)}$$

$$(\operatorname{arccos}(x))' = -\frac{1}{\sqrt{1-x^2}}$$

$$(\operatorname{arcctg}(x))' = -\frac{1}{1+x^2}$$

$$(\operatorname{arch}(x))' = \frac{1}{\sqrt{x^2-1}}$$

$$(\operatorname{arcth}(x))' = \frac{1}{1-x^2}, \quad |x| > 1$$

INTEGRÁLÁSI SZABÁLYOK:

$$\int c f(x) dx = c \int f(x) dx, \quad (c \text{ konstans})$$

$$\int f(x) + g(x) dx = \int f(x) dx + \int g(x) dx$$

$$\int f(x) g'(x) dx = f(x) g(x) - \int f'(x) g(x) dx$$

$$\int f(ax+b) dx = \frac{1}{a} F(ax+b) + c, \quad a, b \in \mathbb{R}, F'(x) = f(x)$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + c$$

$$\int e^x dx = e^x + c$$

$$\int \sin(x) dx = -\cos(x) + c$$

$$\int \operatorname{tg}(x) dx = -\ln|\cos(x)| + c$$

$$\int \frac{1}{x} dx = \ln|x| + c$$

$$\int a^x dx = \frac{a^x}{\ln(a)} + c$$

$$\int \cos(x) dx = \sin(x) + c$$

$$\int \ln(x) dx = x \ln(x) - x + c$$

TAYLOR-SOROK:

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + x + \frac{x^2}{2} + \dots, \quad x \in \mathbb{R}$$

$$\sin(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!} = x - \frac{x^3}{6} + \frac{x^5}{120} - \dots, \quad x \in \mathbb{R}$$

$$\cos(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!} = 1 - \frac{x^2}{2} + \frac{x^4}{24} - \dots, \quad x \in \mathbb{R}$$

$$\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n = 1 + x + x^2 + \dots, \quad |x| < 1$$