

## Formelblad att bifoga tentamen 190116

### Trigonometriska formler

$$\begin{aligned}\cos(x+y) &= \cos x \cdot \cos y - \sin x \cdot \sin y & \sin(x+y) &= \sin x \cdot \cos y + \cos x \cdot \sin y & \tan(x+y) &= \frac{\tan x + \tan y}{1 - \tan x \cdot \tan y} \\ \cos x \cdot \cos y &= \frac{1}{2}(\cos(x+y) + \cos(x-y)) & \sin x \cdot \cos y &= \frac{1}{2}(\sin(x+y) + \sin(x-y)) & \cos^2 x &= \frac{1}{2}(1 + \cos 2x) \\ \sin x \cdot \sin y &= \frac{1}{2}(\cos(x-y) - \cos(x+y)) & & & \sin^2 x &= \frac{1}{2}(1 - \cos 2x)\end{aligned}$$

### Maclaurinserier

$$\begin{aligned}e^x &= \sum_{k=0}^{\infty} \frac{x^k}{k!} = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \cdots + \frac{x^k}{k!} + \cdots & \text{f\u00f6r alla } x \\ \cos x &= \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k}}{2k!} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} + \cdots + (-1)^k \frac{x^{2k}}{(2k)!} + \cdots & \text{f\u00f6r alla } x \\ \sin x &= \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k+1}}{(2k+1)!} = \frac{x^1}{1!} - \frac{x^3}{3!} + \cdots + (-1)^k \frac{x^{2k+1}}{(2k+1)!} + \cdots & \text{f\u00f6r alla } x \\ \ln(1+x) &= \sum_{k=0}^{\infty} (-1)^k \frac{x^{k+1}}{k+1} = x - \frac{x^2}{2} + \frac{x^3}{3} + \cdots + (-1)^k \frac{x^k}{k} + \cdots & \text{n\u00e4r } -1 < x \leq 1 \\ \arctan x &= \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{2k+1} = x - \frac{x^3}{3} + \frac{x^5}{5} + \cdots + (-1)^k \frac{x^{2k+1}}{2k+1} + \cdots & \text{n\u00e4r } |x| \leq 1 \\ (1+x)^\alpha &= \sum_{k=0}^{\infty} \binom{\alpha}{k} x^k = 1 + \alpha x + \binom{\alpha}{2} x^2 + \cdots + \binom{\alpha}{k} x^k + \cdots & \text{n\u00e4r } |x| < 1\end{aligned}$$