

## Formelblad för TMV130, läsåret 2011/12

### Trigonometri.

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

### Maclaurinutvecklingar

$$\begin{aligned}e^x &= \sum_{k=0}^{\infty} \frac{x^k}{k!} &= 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots \\ \sin x &= \sum_{k=1}^{\infty} (-1)^{k-1} \frac{x^{2k-1}}{(2k-1)!} &= x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots \\ \cos x &= \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!} &= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots \\ (1+x)^\alpha &= \sum_{k=0}^{\infty} \binom{\alpha}{k} x^k &= 1 + \alpha x + \frac{\alpha(\alpha-1)}{2!} x^2 + \dots \quad , \quad |x| < 1 \quad , \quad \binom{\alpha}{k} = \frac{\alpha(\alpha-1)\dots(\alpha-k+1)}{k(k-1)\dots 1} \\ \ln(1+x) &= \sum_{k=1}^{\infty} (-1)^{k+1} \frac{x^k}{k} &= x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots \quad , \quad -1 < x \leq 1 \\ \arctan x &= \sum_{k=1}^{\infty} (-1)^{k-1} \frac{x^{2k-1}}{2k-1} &= x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \dots \quad , \quad |x| \leq 1\end{aligned}$$