

**Formelsamling**  
**Vid tentamen MVE 270 Flervariabelanalys**

**Trigonometriska formler**

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

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

$$\cos(x + y) = \cos x \cos y - \sin x \sin y$$

$$\cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x = 2 \cos^2 x - 1 = 1 - 2 \sin^2 x$$

$$\tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$$

**Några integraler**

$$\int x^n dx = \frac{x^{n+1}}{n+1}, \quad n \neq -1$$

$$\int \frac{dx}{x} = \ln|x|$$

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

$$\int \ln x dx = x \ln x - x$$

$$\int \sin x dx = -\cos x$$

$$\int \cos x dx = \sin x$$

$$\int \tan x dx = -\ln|\cos x|$$

$$\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \arctan \frac{x}{a}$$

$$\int \frac{x dx}{a^2 + x^2} = \frac{1}{2} \ln(a^2 + x^2)$$

$$\int \sqrt{x^2 + a^2} dx = \frac{1}{2} x \sqrt{x^2 + a^2} + \frac{1}{2} a^2 \ln \left( x + \sqrt{x^2 + a^2} \right)$$

**Rymdpolära koordinater**

$$\begin{cases} x = r \sin \theta \cos \varphi \\ y = r \sin \theta \sin \varphi \\ z = r \cos \theta \end{cases}$$

$$\frac{d(x, y, z)}{d(r, \theta, \varphi)} = r^2 \sin \theta$$