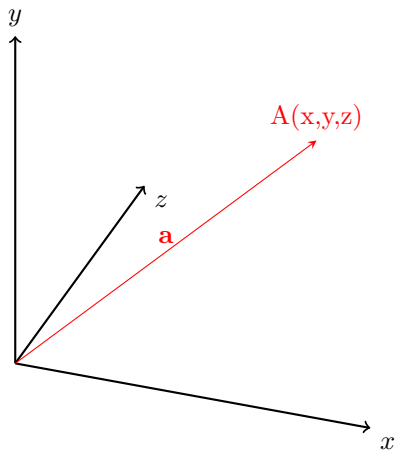
Differentiation

1 3D Vectors



$\overrightarrow{OA} = xi + yj + zk$

$\overrightarrow{OA} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$

Magnitude of $\overrightarrow{OA}$

$|\overrightarrow{OA}| = \sqrt{x^2 + y^2 + z^2}$

The vector between two vectors

$\overrightarrow{OA} = \begin{pmatrix} x_1 \\ y_1 \\ z_1 \end{pmatrix} \quad \overrightarrow{OB} = \begin{pmatrix} x_2 \\ y_2 \\ z_2 \end{pmatrix}$

$|\overrightarrow{AB}| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$

2 Vector dot product

The vector