Plot af vektorer i 3D

> *restart*

> *with*(*plots*) :

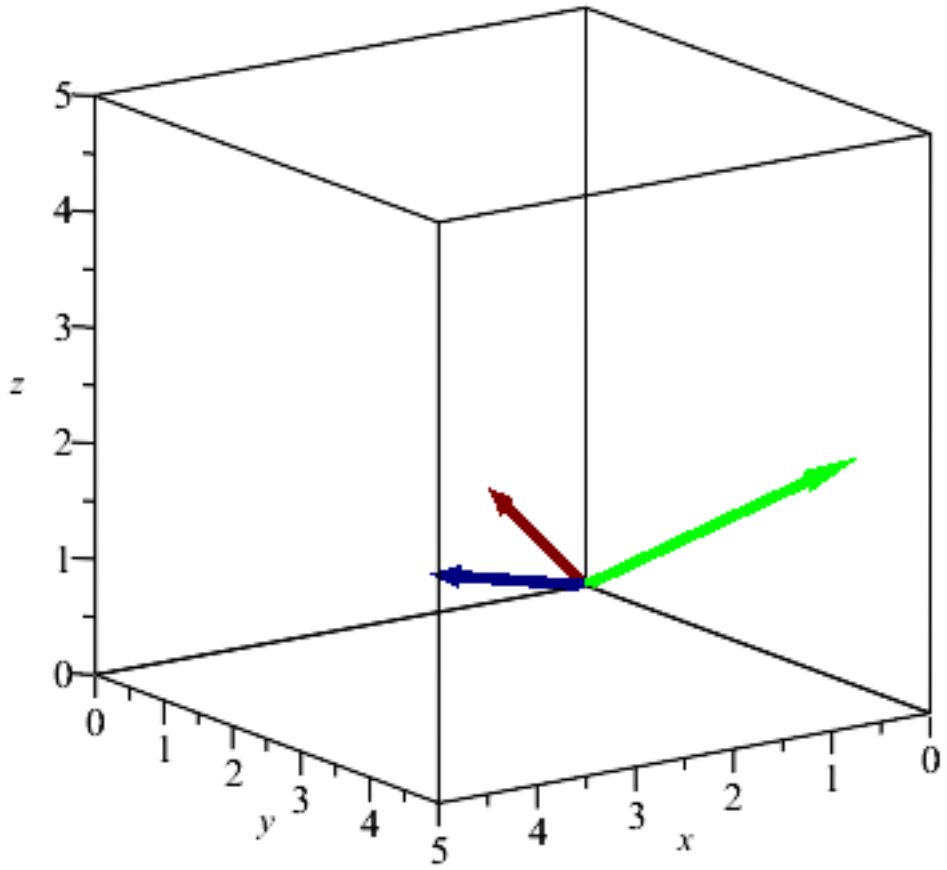
Stedvektorer tegnes

> $pilRED := arrow(\langle 1, 0, 1\rangle, color = red, shape = double_arrow, width = 0.1)$:

> $pilGREEN := arrow(\langle 0, 4, 2\rangle, color = green, shape = double_arrow, width = 0.1)$:

> $pilBLUE := arrow(\langle 3, 2, 1\rangle, color = blue, shape = double_arrow, width = 0.1)$:

> $display(pilRED, pilGREEN, pilBLUE, axes = boxed, labels = [x, y, z], view = [0..5, 0..5, 0..5])$



Standard enhedsvektorer på de 3 akser

> $\vec{i} := \langle 1, 0, 0\rangle; \vec{j} := \langle 0, 1, 0\rangle; \vec{k} := \langle 0, 0, 1\rangle$

$$\vec{i} := \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

$$\vec{j} := \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

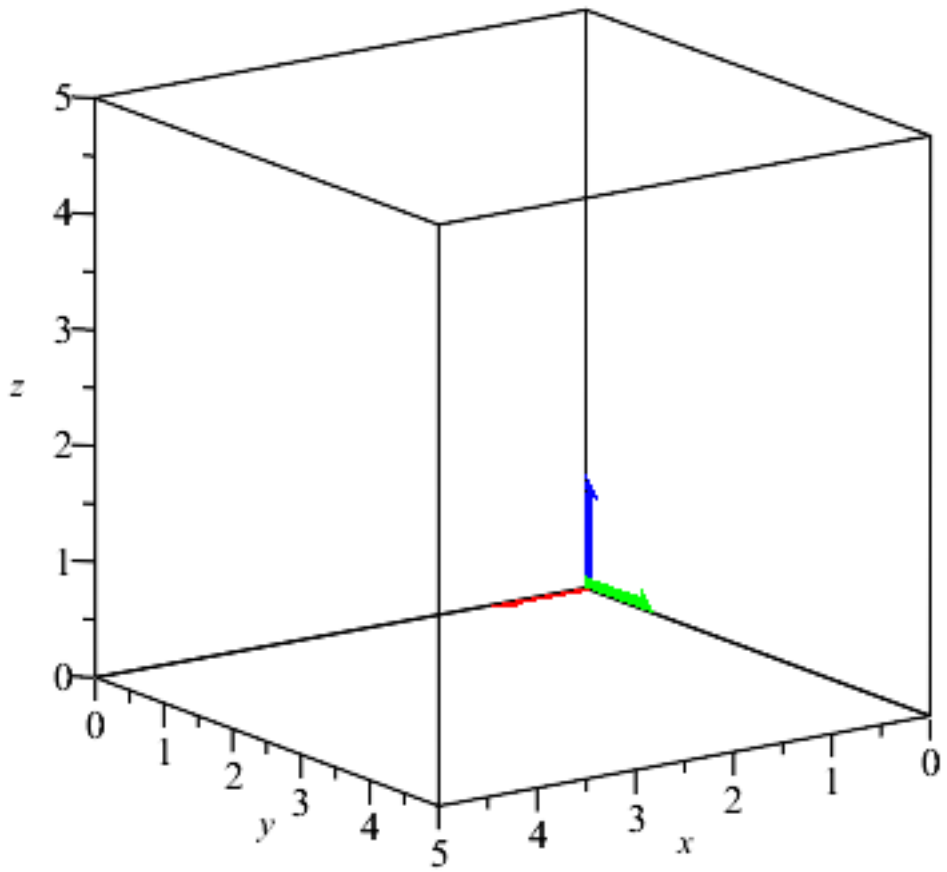
$$\vec{k} := \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \tag{2.1}$$

> $pilX := arrow(\vec{i}, color = red, shape = double_arrow, width = 0.2)$:

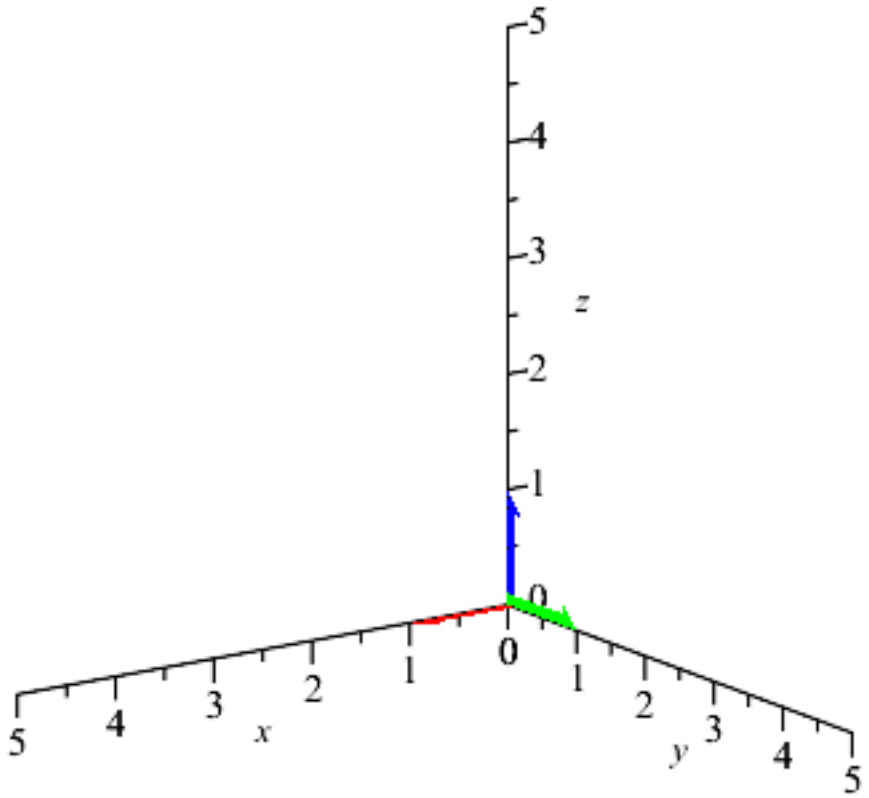
> $pilY := arrow(\vec{j}, color = green, shape = double_arrow, width = 0.2)$:

> $pilZ := arrow(\vec{k}, color = blue, shape = double_arrow, width = 0.2)$:

> $display(pilX, pilY, pilZ, axes = boxed, labels = [x, y, z], view = [0..5, 0..5, 0..5])$



> $display(pilX, pilY, pilZ, axes = normal, labels = [x, y, z], view = [0..5, 0..5, 0..5])$



Vektor generelt

Angiv startpunkt P, f.eks. (0,2,3), og selve vektoren $\vec{a}$, f.eks. (1,-2,2)

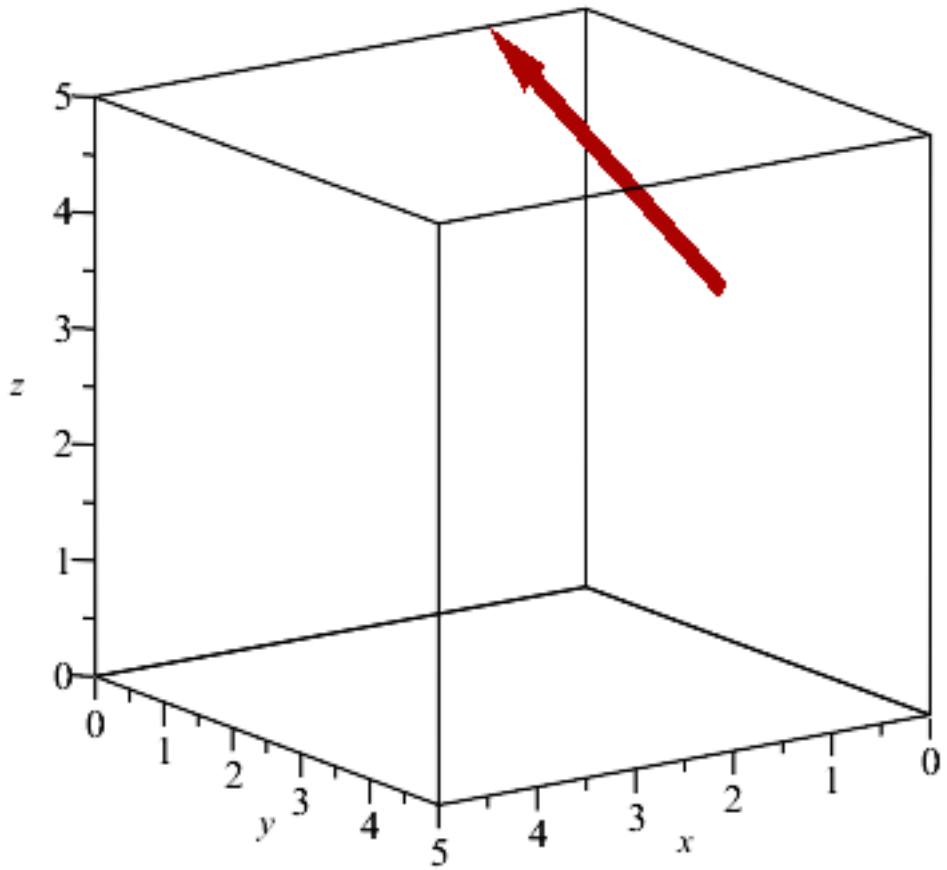
> $P := \langle 0, 2, 3 \rangle ; \vec{a} := \langle 1, -2, 2 \rangle$

$$P := \begin{bmatrix} 0 \\ 2 \\ 3 \end{bmatrix}$$

$$\vec{a} := \begin{bmatrix} 1 \\ -2 \\ 2 \end{bmatrix} \tag{3.1}$$

> $pilVEKTOR := arrow(P, \vec{a}, color = red, shape = double_arrow, width = 0.2) :$

> $display(pilVEKTOR, axes = boxed, labels = [x, y, z], view = [0..5, 0..5, 0..5])$



Indskudssætningen

Vise betydningen af **indskudssætningen**: $\overrightarrow{AB} = \overrightarrow{AC} + \overrightarrow{CB}$

> $A := \langle 0, 3, 0 \rangle; B := \langle 5, 3, 5 \rangle; C := \langle 2, 5, 2 \rangle$

$$A := \begin{bmatrix} 0 \\ 3 \\ 0 \end{bmatrix}$$

$$B := \begin{bmatrix} 5 \\ 3 \\ 5 \end{bmatrix}$$

$$C := \begin{bmatrix} 2 \\ 5 \\ 2 \end{bmatrix} \quad \textbf{(4.1)}$$

> $\overrightarrow{AB} := B - A; \overrightarrow{AC} := C - A; \overrightarrow{CB} := B - C$

$$\overrightarrow{AB} := \begin{bmatrix} 5 \\ 0 \\ 5 \end{bmatrix}$$

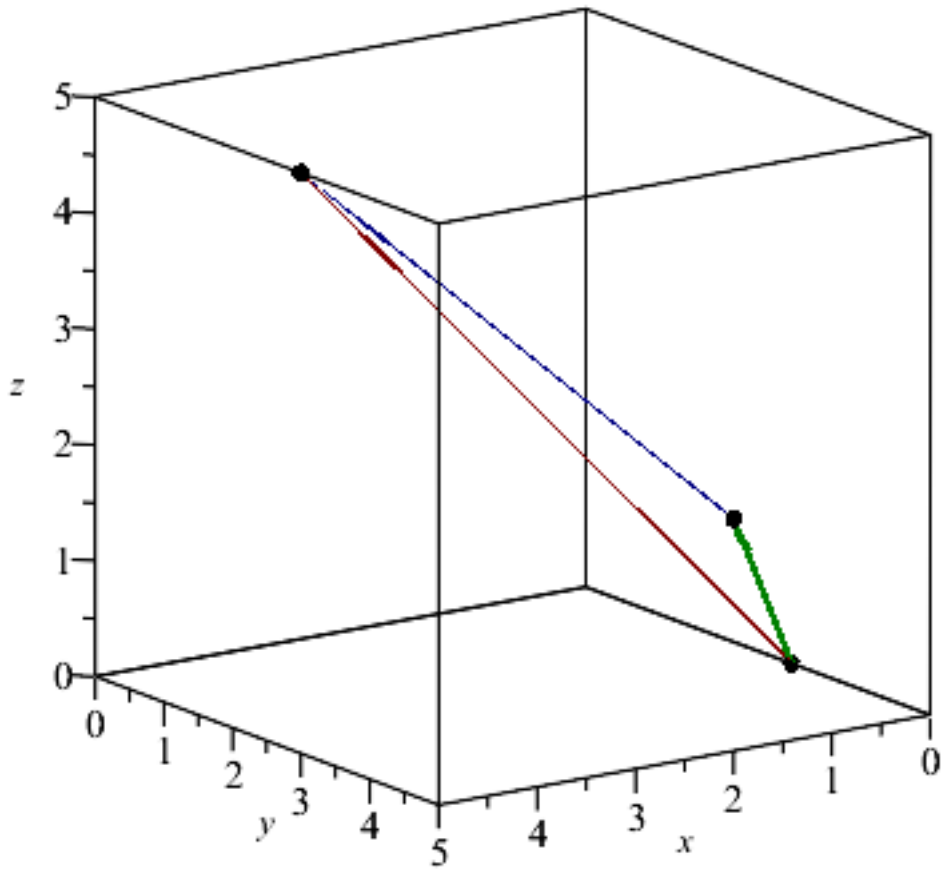
$$\overrightarrow{AC} := \begin{bmatrix} 2 \\ 2 \\ 2 \end{bmatrix}$$

$$\overrightarrow{CB} := \begin{bmatrix} 3 \\ -2 \\ 3 \end{bmatrix} \tag{4.2}$$

> $INDSKUDSsætningen := \overrightarrow{AB} = \overrightarrow{AC} + \overrightarrow{CB}$

$$INDSKUDSsætningen := \begin{bmatrix} 5 \\ 0 \\ 5 \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \\ 5 \end{bmatrix} \tag{4.3}$$

> $punkter := pointplot3d([A, B, C], symbol = solidsphere, symbolsize = 15, color = black) :$
$pilAB := arrow(A, \overrightarrow{AB}, color = red, shape = double_arrow, width = 0.1) :$
$pilAC := arrow(A, \overrightarrow{AC}, color = green, shape = double_arrow, width = 0.1) :$
$pilCB := arrow(C, \overrightarrow{CB}, color = blue, shape = double_arrow, width = 0.1) :$
$display(punkter, pilAB, pilAC, pilCB, axes = normal, labels = [x, y, z], view = [0..5, 0..5, 0..5], axes = box)$



Drej figuren med musen!