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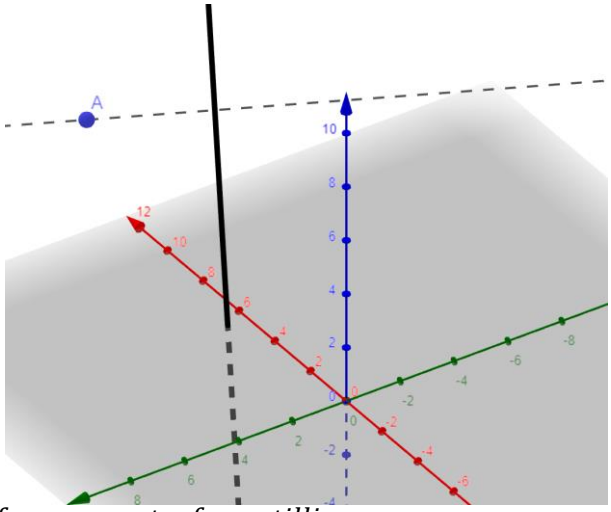
Opgave 503

$$P_0(10,3,6)$$

$$a: \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 3+2t \\ 2-1t \\ -5+4t \end{pmatrix}$$



$P(3,2,-5)$ *Finder linjens start punk udfra parameterfremstillingen*

$\vec{r} = \begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix}$ *Finder linjesn retnings vektor ud fra parameter fremstillingen*

$$\overrightarrow{PP_0} = P_0 - P$$
$$\overrightarrow{PP_0} = \begin{pmatrix} 10 \\ 3 \\ 6 \end{pmatrix} - \begin{pmatrix} 3 \\ 2 \\ -5 \end{pmatrix}$$
$$\overrightarrow{PP_0} = \begin{pmatrix} 7 \\ 1 \\ 11 \end{pmatrix}$$

$$\vec{V} = \vec{r} \times \overrightarrow{PP_0}$$
$$\vec{V} = \begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix} \times \begin{pmatrix} 7 \\ 1 \\ 11 \end{pmatrix}$$
$$\vec{V} = \begin{pmatrix} -15 \\ 6 \\ 9 \end{pmatrix}$$

$$|\vec{v}| = \sqrt{x^2 + y^2 + z^2}$$

$$|\vec{r}| = \sqrt{2^2 + (-1)^2 + 4^2}$$
$$|\vec{r}| = 4{,}582576$$

$$\left|\vec{V}\right| = \sqrt{(-15)^2 + 6^2 + 9^2}$$
$$\left|\vec{V}\right| = 18{,}49324$$

$$e = \frac{\left|\vec{V}\right|}{|\vec{r}|}$$

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$$e = \frac{18.49}{4.58}$$
$$e = 4{,}037118$$