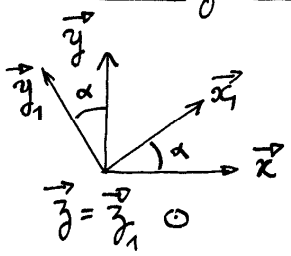
Calculez les produits vectoriels suivants : les $(\vec{x_i}, \vec{y_i}, \vec{z_i})$ sont des bases orthonormées directes.

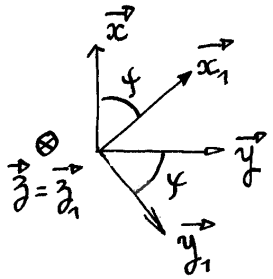


$\vec{x} \wedge \vec{x_1} =$

$\vec{z} \wedge \vec{y_1} =$

$\vec{y} \wedge \vec{x_1} =$

$\vec{x} \wedge \vec{y_1} =$

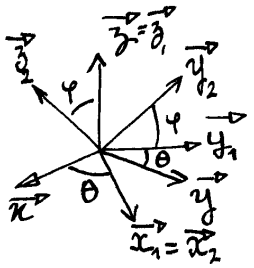


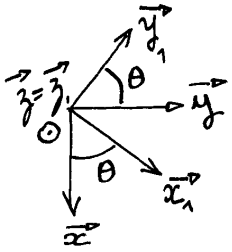
$\vec{x} \wedge \vec{z} =$

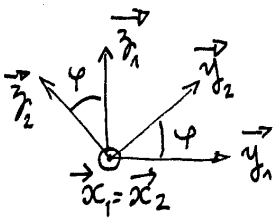
$\vec{x_1} \wedge \vec{y} =$

$\vec{x} \wedge \vec{y_1} =$

$\vec{y_1} \wedge \vec{z} =$







$\vec{x_1} \wedge \vec{z_2} =$

$\vec{y_1} \wedge \vec{y_2} =$

$\vec{y_1} \wedge \vec{z_2} =$

$\vec{x_1} \wedge \vec{y} =$

$\vec{x} \wedge \vec{y_1} =$

$\vec{z_1} \wedge \vec{y_2} =$

$\vec{z} \wedge \vec{z_2}$

et : $\vec{y} \wedge \vec{z_2}$

$\vec{x} \wedge \vec{x_2} = \sin\alpha\, \vec{z_2}$; $\vec{z_2} \wedge \vec{y_2} = -\vec{x_2}$; $\vec{y} \wedge \vec{y_2} = -\cos\alpha\, \vec{z_2}$; $\vec{x} \wedge \vec{y_2} = \cos\alpha\, \vec{z_2}$

$\vec{x} \wedge \vec{z_2} = -\vec{y_2}$; $\vec{x_2} \wedge \vec{y_2} = \cos\varphi\, \vec{z_2}$; $\vec{x} \wedge \vec{x_2} = \vec{x_2}$.

$\vec{x_2} \wedge \vec{x_1} = \sin\varphi\, \vec{z_1}$; $\vec{z_2} \wedge \vec{y_1} = -\vec{x_1}$; $\vec{y} \wedge \vec{x_1} = -\cos\alpha\, \vec{z_1}$; $\vec{x} \wedge \vec{y_1} = \cos\alpha\, \vec{z_1}$

$\vec{x_1} \wedge \vec{z_1} = -\vec{y_1}$; $\vec{y_1} \wedge \vec{z_1} = \cos\varphi\, \vec{x_1}$; $\vec{y_1} \wedge \vec{x_1} = \sin\varphi\, \vec{z_1}$; $\vec{x_1} \wedge \vec{y_1} = \cos\theta\, \vec{z_1}$

$\vec{x} \wedge \vec{y_1} = \cos\theta\, \vec{z_1}$; $\vec{z_1} \wedge \vec{y_1} = -\cos\varphi\, \vec{x_1}$; $\vec{z_1} \wedge \vec{z_2} = \sin\varphi\, \vec{x_1}$

$\vec{y} \wedge \vec{z_2} = (\cos\theta\, \vec{y_1} + \sin\theta\, \vec{x_1}) \wedge \vec{z_2} = \cos\theta\cos\varphi\, \vec{x_1} - \sin\theta\, \vec{y_2}$