

RAPPELS :

x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π
$\cos x$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1

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

$$\cos(\pi - x) = -\cos x$$

$$\cos(\pi + x) = -\cos x$$

EXERCICE 2A.1 Dans chaque cas, calculer le produit scalaire $\vec{u} \cdot \vec{v}$:

$\ \vec{u}\ = 4$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = \frac{\pi}{4}$ $\rightarrow \vec{u} \cdot \vec{v} =$	$\ \vec{u}\ = 5$, $\ \vec{v}\ = 2$, $(\vec{u}, \vec{v}) = \frac{\pi}{3}$ $\rightarrow \vec{u} \cdot \vec{v} =$
$\ \vec{u}\ = 7$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = -\frac{\pi}{6}$ $\rightarrow \vec{u} \cdot \vec{v} =$	$\ \vec{u}\ = 352$, $\ \vec{v}\ = 812$, $(\vec{u}, \vec{v}) = \frac{\pi}{2}$ $\rightarrow \vec{u} \cdot \vec{v} =$
$\ \vec{u}\ = \sqrt{2}$, $\ \vec{v}\ = 2$, $(\vec{u}, \vec{v}) = \frac{3\pi}{4}$ $\rightarrow \vec{u} \cdot \vec{v} =$	$\ \vec{u}\ = 4$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = -\frac{2\pi}{3}$ $\rightarrow \vec{u} \cdot \vec{v} =$
$\ \vec{u}\ = 2\sqrt{3}$, $\ \vec{v}\ = \frac{1}{2}$, $(\vec{u}, \vec{v}) = \frac{5\pi}{6}$ $\rightarrow \vec{u} \cdot \vec{v} =$	$\ \vec{u}\ = \sqrt{5}$, $\ \vec{v}\ = 2\sqrt{5}$, $(\vec{u}, \vec{v}) = \pi$ $\rightarrow \vec{u} \cdot \vec{v} =$

EXERCICE 2A.2

Dans chaque cas, calculer le produit scalaire :

$$\rightarrow \vec{v} \cdot \vec{w} =$$

$$\rightarrow \vec{u} \cdot \vec{w} =$$

$$\rightarrow \vec{x} \cdot \vec{y} =$$

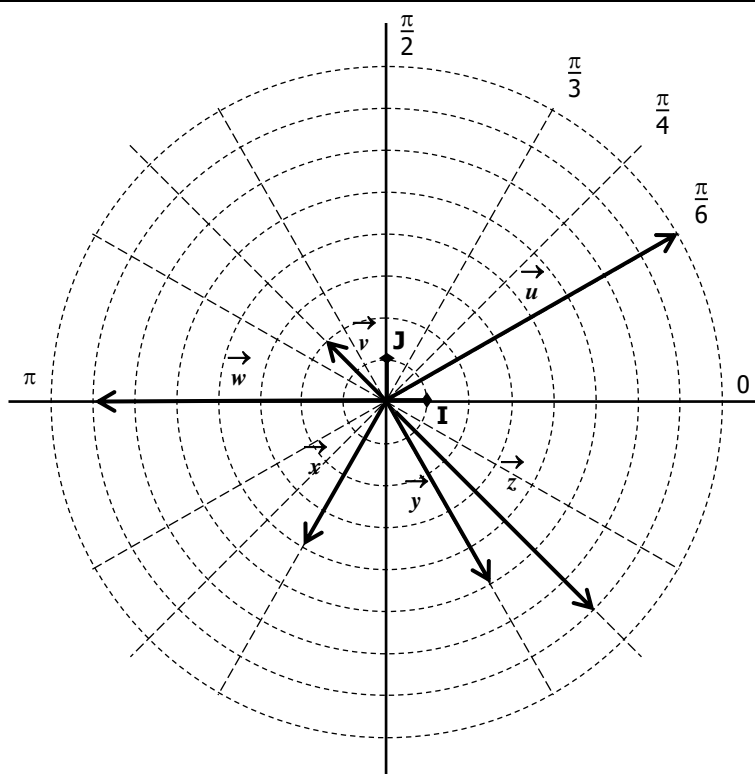
$$\rightarrow \vec{u} \cdot \vec{y} =$$

$$\rightarrow \vec{x} \cdot \vec{w} =$$

$$\rightarrow \vec{u} \cdot \vec{x} =$$

$$\rightarrow \vec{z} \cdot \vec{v} =$$

$$\rightarrow \vec{z} \cdot \vec{w} =$$



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

$$\cos(\pi - x) = -\cos x$$

$$\cos(\pi + x) = -\cos x$$

EXERCICE 2A.1

Dans chaque cas, calculer le produit scalaire $\vec{u} \cdot \vec{v} = \|\vec{u}\| \times \|\vec{v}\| \times \cos(\vec{u}, \vec{v})$:

$\ \vec{u}\ = 4$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = \frac{\pi}{4}$ $\rightarrow \vec{u} \cdot \vec{v} = 4 \times 3 \times \cos \frac{\pi}{4} = 12 \times \frac{\sqrt{2}}{2} = 6\sqrt{2}$	$\ \vec{u}\ = 5$, $\ \vec{v}\ = 2$, $(\vec{u}, \vec{v}) = \frac{\pi}{3}$ $\rightarrow \vec{u} \cdot \vec{v} = 5 \times 2 \times \cos \frac{\pi}{3} = 10 \times \frac{1}{2} = 5$
$\ \vec{u}\ = 7$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = -\frac{\pi}{6}$ $\rightarrow \vec{u} \cdot \vec{v} = 7 \times 3 \times \cos\left(-\frac{\pi}{6}\right) = 21 \times \frac{\sqrt{3}}{2} = \frac{21\sqrt{3}}{2}$	$\ \vec{u}\ = 352$, $\ \vec{v}\ = 812$, $(\vec{u}, \vec{v}) = \frac{\pi}{2}$ $\rightarrow \vec{u} \cdot \vec{v} = 352 \times 812 \times \cos \frac{\pi}{2} = 352 \times 812 \times 0 = 0$
$\ \vec{u}\ = \sqrt{2}$, $\ \vec{v}\ = 2$, $(\vec{u}, \vec{v}) = \frac{3\pi}{4}$ $\rightarrow \vec{u} \cdot \vec{v} = \sqrt{2} \times 2 \times \cos \frac{3\pi}{4} = 2\sqrt{2} \times \left(-\frac{\sqrt{2}}{2}\right) = -2$	$\ \vec{u}\ = 4$, $\ \vec{v}\ = 3$, $(\vec{u}, \vec{v}) = -\frac{2\pi}{3}$ $\rightarrow \vec{u} \cdot \vec{v} = 4 \times 3 \times \cos\left(-\frac{2\pi}{3}\right) = 12 \times \left(-\frac{1}{2}\right) = -6$
$\ \vec{u}\ = 2\sqrt{3}$, $\ \vec{v}\ = \frac{1}{2}$, $(\vec{u}, \vec{v}) = \frac{5\pi}{6}$ $\rightarrow \vec{u} \cdot \vec{v} = 2\sqrt{3} \times \frac{1}{2} \times \cos \frac{5\pi}{6} = \sqrt{3} \times \left(-\frac{\sqrt{3}}{2}\right) = -\frac{3}{2}$	$\ \vec{u}\ = \sqrt{5}$, $\ \vec{v}\ = 2\sqrt{5}$, $(\vec{u}, \vec{v}) = \pi$ $\rightarrow \vec{u} \cdot \vec{v} = \sqrt{5} \times 2\sqrt{5} \times \cos \pi = 10 \times (-1) = -10$

EXERCICE 2A.2

Calculer les produits scalaires :

$$\rightarrow \vec{v} \cdot \vec{w} = 2 \times 7 \times \cos \frac{\pi}{4} = 14 \times \frac{\sqrt{2}}{2} = 7\sqrt{2}$$

$$\rightarrow \vec{u} \cdot \vec{w} = 8 \times 7 \times \cos \frac{5\pi}{6} = 56 \times \left(-\frac{\sqrt{3}}{2}\right) = -28\sqrt{3}$$

$$\rightarrow \vec{x} \cdot \vec{y} = 4 \times 5 \times \cos \frac{\pi}{3} = 20 \times \frac{1}{2} = 10$$

$$\rightarrow \vec{u} \cdot \vec{y} = 8 \times 5 \times \cos\left(-\frac{\pi}{2}\right) = 40 \times 0 = 0$$

$$\rightarrow \vec{x} \cdot \vec{w} = 4 \times 7 \times \cos\left(-\frac{\pi}{3}\right) = 28 \times \frac{1}{2} = 14$$

$$\rightarrow \vec{u} \cdot \vec{x} = 8 \times 4 \times \cos\left(-\frac{5\pi}{6}\right) = 32 \times \left(-\frac{\sqrt{3}}{2}\right) = -16\sqrt{3}$$

$$\rightarrow \vec{z} \cdot \vec{v} = 7 \times 2 \times \cos \pi = 14 \times (-1) = -14$$

$$\rightarrow \vec{z} \cdot \vec{w} = 7 \times 7 \times \cos \frac{3\pi}{4} = 49 \times \left(-\frac{\sqrt{2}}{2}\right) = -\frac{49\sqrt{2}}{2}$$

