1. Compute the length of **1 / 1 punto**

$$\mathbf{x} = \begin{bmatrix} 1 \\ -1 \\ 3 \end{bmatrix}$$

using the inner product defined

$$\langle \mathbf{a}, \mathbf{b} \rangle = \mathbf{a}^T \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix} \mathbf{b}$$

Do the exercise using pen and paper.

- ○ $\sqrt{29}$
- ◉ $\sqrt{26}$
- ○ $\sqrt{31}$
- ○ $\sqrt{11}$
- ○ 26

Correcto
Good job.

2. Compute the squared distance between **1 / 1 punto**

$$\mathbf{x} = \begin{bmatrix} \frac{1}{2} \\ -1 \\ -\frac{1}{2} \end{bmatrix}$$

and

$$\mathbf{y} = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

using the inner product defined as

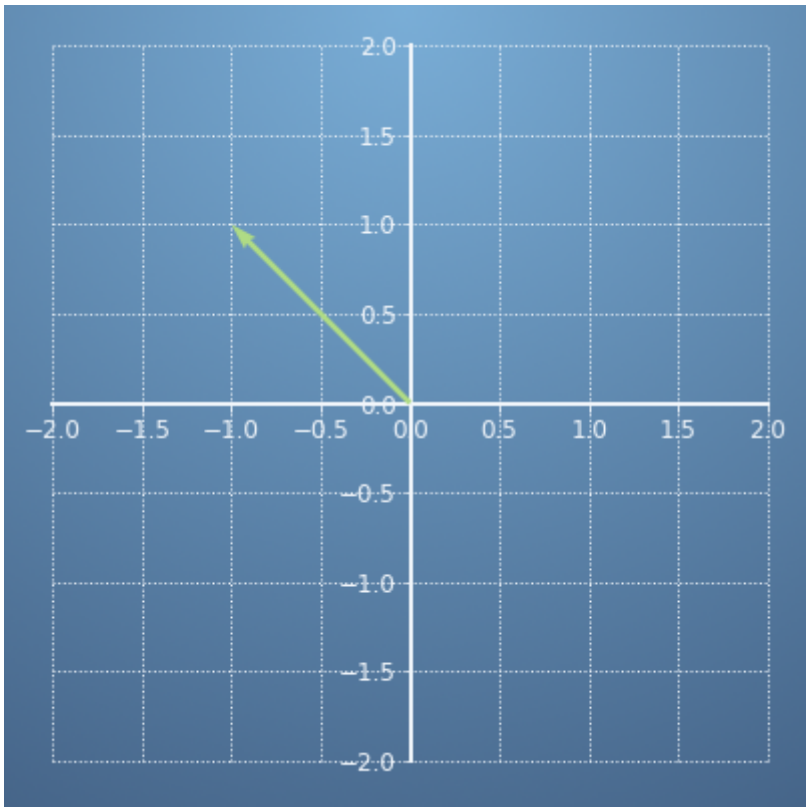
$$\langle \mathbf{a}, \mathbf{b} \rangle = \mathbf{a}^T \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix} \mathbf{b}$$

Do the exercise using pen and paper.

- $\sqrt{5}$
- 5
- $\sqrt{\frac{9}{2}}$
- $\frac{9}{2}$

Correcto
Well done.

3. **1 / 1 punto**



Compute the length of $\mathbf{x} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ using the inner product defined by

$$\langle \mathbf{a}, \mathbf{b} \rangle = \mathbf{a}^T \frac{1}{2} \begin{bmatrix} 5 & -1 \\ -1 & 5 \end{bmatrix} \mathbf{b}$$

Do the exercise using pen and paper.

- ○ $\sqrt{2}$
- ○ $\sqrt{12}$
- ○ 12
- ○ 6
- ◉ $\sqrt{6}$

Correcto
Good job!

4. Compute the distance (not squared) between **1 / 1 punto**

$$\mathbf{x} = \begin{bmatrix} 4 \\ 2 \\ 1 \end{bmatrix}$$

and

$$\mathbf{y} = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

using the inner product defined as

$$\langle \mathbf{a}, \mathbf{b} \rangle = \mathbf{a}^T \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix} \mathbf{b}$$

Do the exercise using pen and paper (and calculator if necessary). Please enter a decimal number.

6.48

Correcto
Well done!

5. **1 / 1 punto**

Compute the length of $\mathbf{x} = \begin{bmatrix} -1 \\ -1 \\ -1 \end{bmatrix}$ using the inner product defined as $\langle \mathbf{a}, \mathbf{b} \rangle = \mathbf{a}^T \mathbf{I} \mathbf{b}$ where $\mathbf{I}$ is the identity matrix.

Do the exercise using pen and paper.

- (●) $\sqrt{3}$
- ( ) 3
- ( ) -3
- ( ) $-\sqrt{3}$

Correcto
Well done! Our inner product is the dot product.