

Congratulations! You passed!

Grade received 100%

To pass 80% or higher

**Go to next
item**

1. Compute the length of

1 / 1 point

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

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.

- ☐ $\sqrt{29}$
- ☐ $\sqrt{11}$
- ☐ 26
- ☐ $\sqrt{31}$
- ☒ $\sqrt{26}$

**Correct**

Good job.

2. Compute the squared distance between

1 / 1 point

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

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.

☒ 5☐ $\frac{9}{2}$ ☐ $\sqrt{5}$

☐ $\sqrt{\frac{9}{2}}$

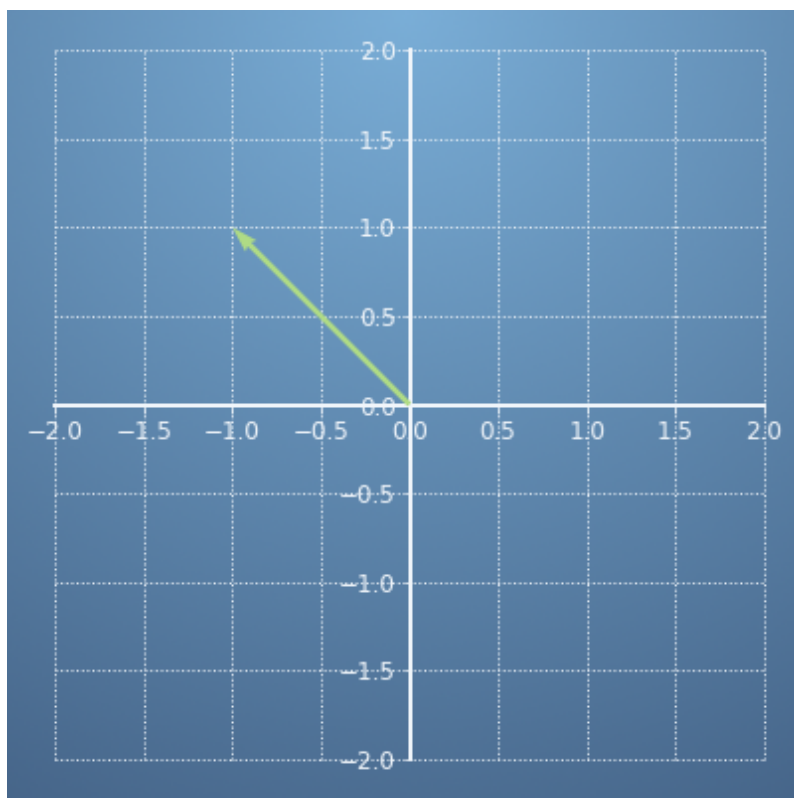


Correct

Well done.

3.

1 / 1 point



Compute the length of

$$\begin{bmatrix} -1 \\ 1 \end{bmatrix}$$

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

$$\begin{bmatrix} 5 & -1 \\ -1 & 5 \end{bmatrix}$$

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

Do the exercise using pen and paper.

☐ 12☒ $\sqrt{6}$ ☐ 6☐ $\sqrt{12}$ ☐ $\sqrt{2}$ **Correct**

Good job!

4. Compute the distance (not squared) between

1 / 1 point

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

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.

6.5



Correct

Well done!

5. Compute the length of

1 / 1 point

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

☐ $-\sqrt{3}$



Correct

Well done! Our inner product is the dot product.