

✔ 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.

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

✔ 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

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

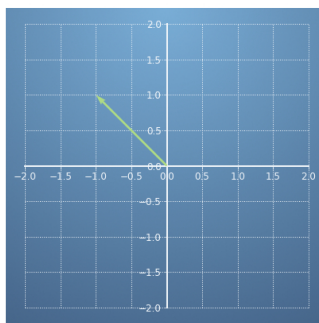
Do the exercise using pen and paper.

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

✔ Correct  
Well done.

3.

1 / 1 point



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.

- ☐  $\sqrt{2}$
- ☐ 6
- ☒  $\sqrt{6}$
- ☐  $\sqrt{12}$
- ☐ 12

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

1 / 1 point

Do the exercise using pen and paper.

☐ -3

☐ 3

☒  $\sqrt{3}$

☐  $-\sqrt{3}$

✔ Correct  
Well done! Our inner product is the dot product.