

✔ Congratulations! You passed!

Grade received 100% To pass 80% or higher

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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.

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

✔ 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.

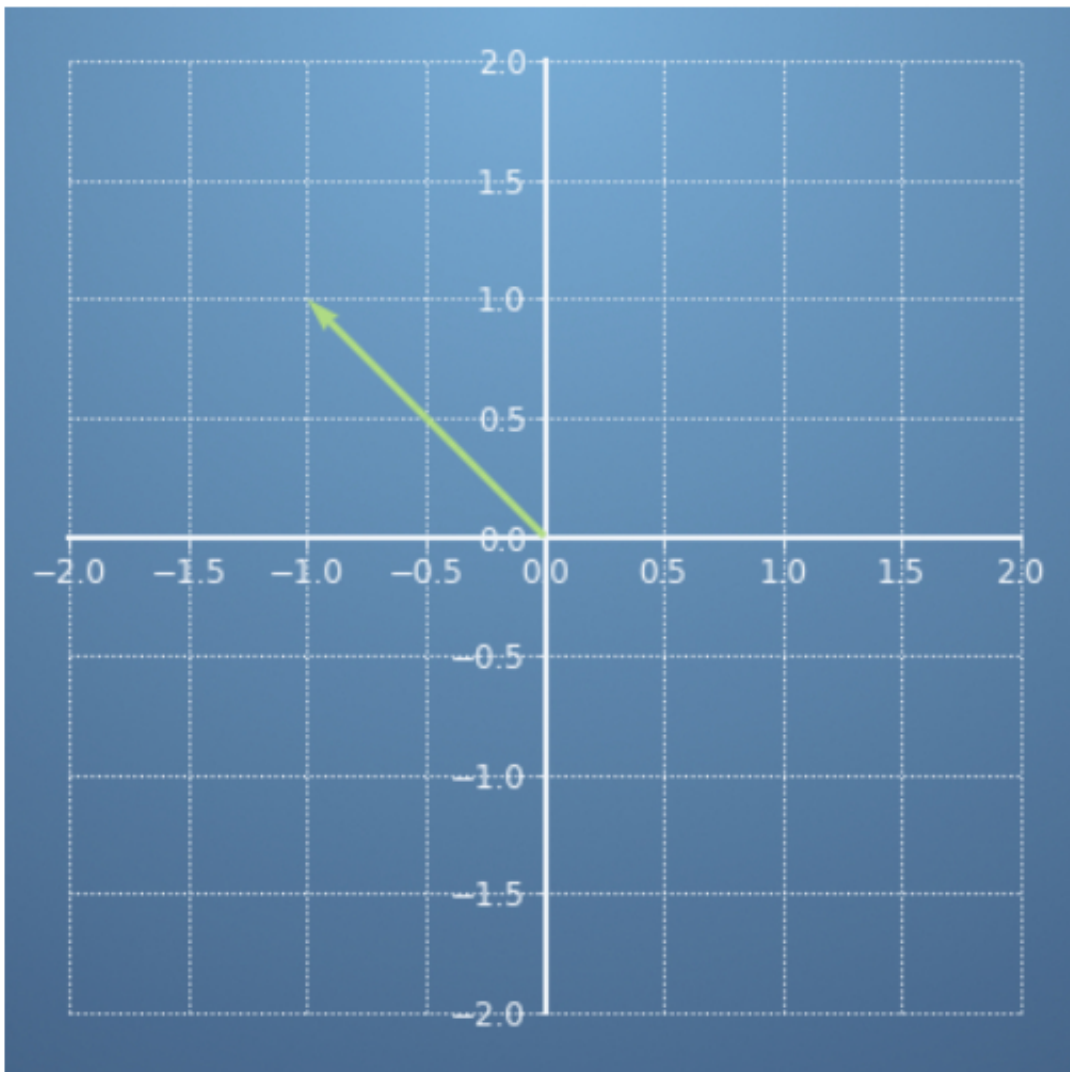
- ☐ $\sqrt{5}$
- ☐ $\sqrt{\frac{9}{2}}$
- ☒ 5
- ☐ $\frac{9}{2}$

✔ 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.

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

✔ 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.

6.48

✔ 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.

- ☒ $\sqrt{3}$
- ☐ 3
- ☐ -3
- ☐ $-\sqrt{3}$

✔ Correct

Well done! Our inner product is the dot product.