

General inner products: lengths and distances

Practice Quiz, 5 questions

5/5 points (100%)



Congratulations! You passed!

Next Item



1 / 1
point

1.

Compute the length of

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

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.



$\sqrt{11}$



26



$\sqrt{26}$



Correct

Good job.



$\sqrt{31}$



$\sqrt{29}$



1 / 1
point

2.

General inner products: lengths and distances

5/5 points (100%)

Practice Quiz, 5 questions

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

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.



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



$\frac{9}{2}$



5



Correct

Well done.



$\sqrt{5}$



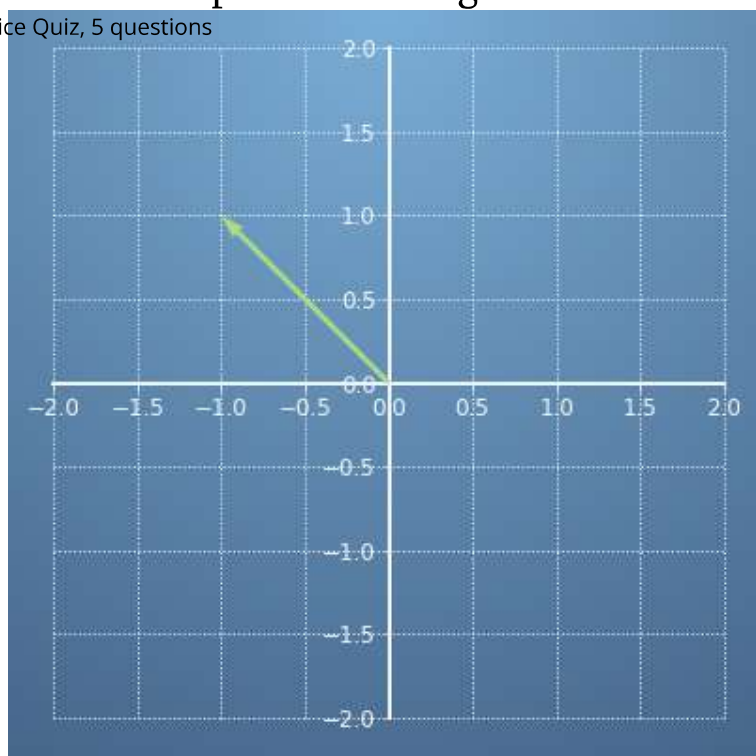
1 / 1
point

3.

General inner products: lengths and distances

Practice Quiz, 5 questions

5/5 points (100%)



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.



$\sqrt{6}$



Correct

Good job!



$\sqrt{2}$



12



$\sqrt{12}$



6



1 / 1
point

4. General inner products: lengths and distances

5/5 points (100%)

Practice Quiz, 5 questions

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

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 Response

Well done!



1 / 1
point

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.

Do the exercise using pen and paper.

☐ -3

☐ $-\sqrt{3}$

☒ $\sqrt{3}$



Correct

Well done! Our inner product is the dot product.

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5/5 points (100%)

