General inner products: lengths and distances

TOTAL POINTS 5

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.

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

- 5

Correct
Well done.

Do the exercise using pen and paper.

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

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
- $-\sqrt{3}$
- -3

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