Your grade: 100%

Your latest: **100%** • Your highest: **100%** • To pass you need at least 80%. We keep your highest score.

Next item →

1. Compute the length of

1 / 1 point

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

using the inner product defined

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

Do the exercise using pen and paper.

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

✓ **Correct**
Good job.

2. Compute the squared distance between

1/1 point

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

and

$$y = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

using the inner product defined as

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

Do the exercise using pen and paper.
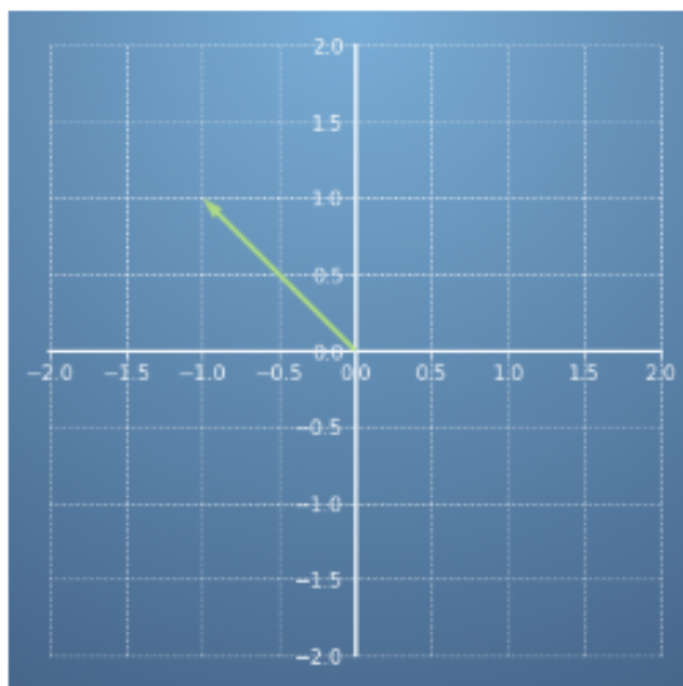
- ○ $\frac{9}{2}$
- ○ $\sqrt{5}$
- ⦿ 5
- ○ $\sqrt{\frac{9}{2}}$

✓ **Correct**

Well done.

3. 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.

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

✓ **Correct**
Good job!

4. Compute the distance (not squared) between

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

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.

Do the exercise using pen and paper.

- ⦿ $\sqrt{3}$
- ◯ $-\sqrt{3}$
- ◯ 3
- ◯ -3

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