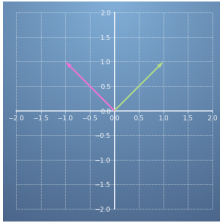


Angles between vectors using a non-standard inner product

LATEST SUBMISSION GRADE
100%

1.

1 / 1 point



Compute the angle between $\mathbf{x} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ using the inner product defined by

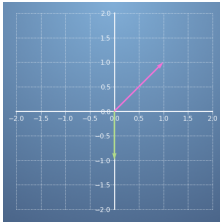
$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 2 & -1 \\ -1 & 4 \end{bmatrix} \mathbf{y}$$

- ☐ 1.57 rad (90°)
- ☒ 1.2 rad (69°)
- ☐ 0.35 rad (20°)

✓ Correct
Absolutely right!

2.

1 / 1 point



Compute the angle between $\mathbf{x} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ using the inner product defined by

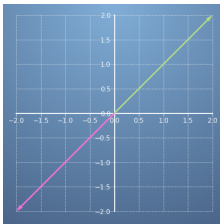
$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 1 & -1 \\ -1 & 5 \end{bmatrix} \mathbf{y}$$

- ☐ 2.35 rad (135°)
- ☒ 2.69 rad (154°)
- ☐ -0.9 rad (-52°)

✓ Correct
Well done!

3.

1 / 1 point



Compute the angle between $\mathbf{x} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} -2 \\ -2 \end{bmatrix}$ using the inner product defined by

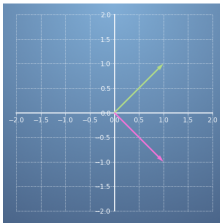
$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 2 & 1 \\ 1 & 4 \end{bmatrix} \mathbf{y}$$

- ☒ 3.14 rad (180°)
- ☐ 0 rad (0°)

✓ Correct
Well done: $\pi \approx 3.14$ is the right answer.

4.

1 / 1 point



Compute the angle between $\mathbf{x} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$ using the inner product defined by

$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 1 & 0 \\ 0 & 5 \end{bmatrix} \mathbf{y}$$

- ☒ 2.3 rad (131°)
- ☐ -2.3 rad (-131°)
- ☐ 1.57 rad (90°)
- ☐ -1.57 rad (-90°)

✓ Correct
Good job.

5.

1 / 1 point

Compute the angle between $\mathbf{x} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} 2 \\ -1 \\ 0 \end{bmatrix}$ using the inner product defined by

$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix} \mathbf{y}$$

- ☐ 0.2 rad (11°)
- ☒ 1.37 rad (78°)
- ☐ 1.31 rad (75°)

✓ Correct
Well done!