Congratulations! You passed!
TO PASS 80% or higher

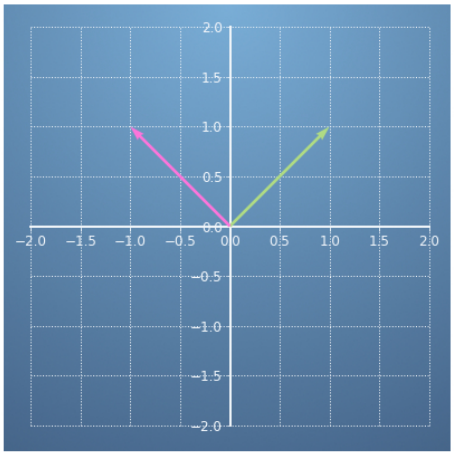
Keep Learning

GRADE
100%

Angles between vectors using a non-standard inner product

LATEST SUBMISSION GRADE
100%

1. **1 / 1 point**



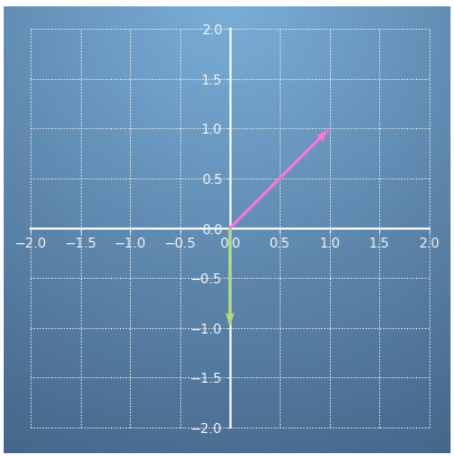
Compute the angle between $\mathbf{x} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$ using the inner product defined by

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

- 1.57 rad ($90°$)
- 1.2 rad ($69°$)
- 0.35 rad ($20°$)

Correct
Absolutely right!

2. **1 / 1 point**



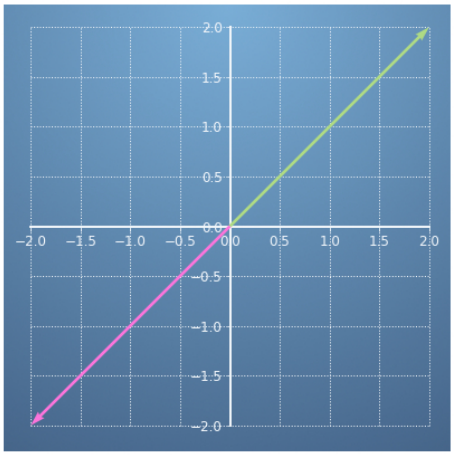
Compute the angle between $\mathbf{x} = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ using the inner product defined by

$$\langle \mathbf{x}, \mathbf{y} \rangle = \mathbf{x}^T \begin{bmatrix} 1 & -\frac{1}{2} \\ -\frac{1}{2} & 5 \end{bmatrix} \mathbf{y}$$

- (●) 2.69 rad (154°)
- ( ) -0.9 rad (-52°)
- ( ) 2.35 rad (135°)

✓ **Correct**
Well done!

3. **1 / 1 point**



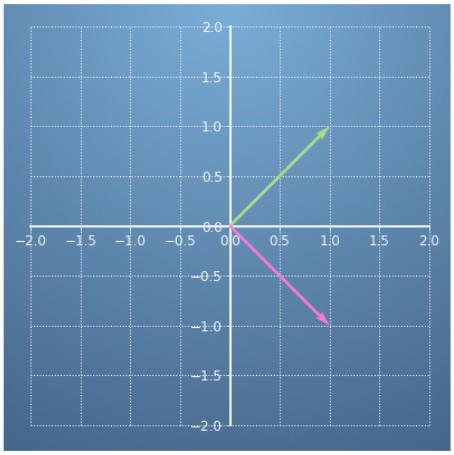
Compute the angle between $\mathbf{x} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} -2 \\ -2 \end{bmatrix}$ using the inner product defined by

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

- ( ) 0 rad (0°)
- (●) 3.14 rad (180°)

✓ **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°)
- ( ) 1.57 rad (90°)

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

Correct
Good job.

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

1 / 1 point

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

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

Correct
Well done!