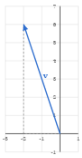
Name

Determine the angle between two vectors

1

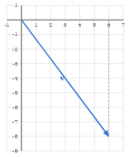
Write the magnitude of the vector as a square root expression.



A	$\lvert\vec{v}\rvert = \sqrt{4+36}$	B	$\lvert\vec{v}\rvert = \sqrt{2+6}$
C	$\lvert\vec{v}\rvert = \sqrt{4-36}$	D	$\lvert\vec{v}\rvert = 2+6$

2

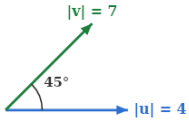
Find the magnitude of the vector.



A	$\lvert\vec{v}\rvert = 9$	B	$\lvert\vec{v}\rvert = 16$
C	$\lvert\vec{v}\rvert = 10$	D	$\lvert\vec{v}\rvert = 12$

3

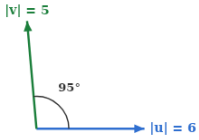
The vectors have magnitudes |u| = 4 and |v| = 7 with an angle of 45° between them. Find u · v.



A	$\vec{u}\cdot\vec{v} = 23.16$	B	$\vec{u}\cdot\vec{v} = 15.43$
C	$\vec{u}\cdot\vec{v} = 15.34$	D	$\vec{u}\cdot\vec{v} = 19.80$

4

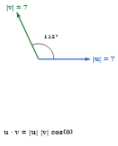
The vectors have magnitudes |u| = 6 and |v| = 5 with an angle of 95° between them. Write u · v using the geometric formula.



A	$\vec{u}\cdot\vec{v} = \frac{6}{5}\cos(95°)$	B	$\vec{u}\cdot\vec{v} = (6)(5)\cos(95°)$
C	$\vec{u}\cdot\vec{v} = (6)+(5)\cos(95°)$	D	$\vec{u}\cdot\vec{v} = (6)(5)\sin(95°)$

5

The vectors have magnitudes |u| = 7 and |v| = 7 with an angle of 115° between them. Write u · v using the geometric formula.



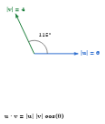
A	$\vec{u}\cdot\vec{v} = (7)(7)\cos(115°)$	B	$\vec{u}\cdot\vec{v} = (7)(7)\sin(115°)$
C	$\vec{u}\cdot\vec{v} = \frac{7}{7}\cos(115°)$	D	$\vec{u}\cdot\vec{v} = (7)+(7)\cos(115°)$

Name

Determine the angle between two vectors

6

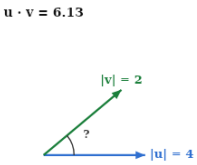
The vectors have magnitudes |u| = 6 and |v| = 4 with an angle of 115° between them. Find u · v.



A	$\vec{u} \cdot \vec{v} = -7.12$	B	$\vec{u} \cdot \vec{v} = -3.88$
C	$\vec{u} \cdot \vec{v} = -10.14$	D	$\vec{u} \cdot \vec{v} = -5.54$

7

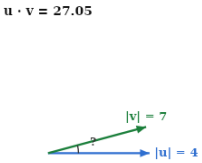
The two vectors have magnitudes |u| = 4 and |v| = 2, and u · v = 6.13. Find the angle between them.



A	40°	B	55°
C	50°	D	30°

8

The two vectors have magnitudes |u| = 4 and |v| = 7, and u · v = 27.05. Find the angle between them.



A	20°	B	15°
C	25°	D	30°

9

Find the acute angle between the two lines.

$$\vec{r} = \begin{pmatrix} 4 \\ -4 \\ 4 \end{pmatrix} + t \begin{pmatrix} 4 \\ -2 \\ 1 \end{pmatrix}$$
$$\vec{r} = \begin{pmatrix} -2 \\ -4 \\ -1 \end{pmatrix} + t \begin{pmatrix} 3 \\ 0 \\ 1 \end{pmatrix}$$

A	$\cos^{-1}\left(\frac{13}{\sqrt{31}}\right)$	B	$\cos^{-1}\left(\frac{14}{\sqrt{21}\sqrt{10}}\right)$
C	$\cos^{-1}\left(\frac{13}{\sqrt{21}\sqrt{10}}\right)$	D	$\sin^{-1}\left(\frac{13}{\sqrt{21}\sqrt{10}}\right)$

10

Find the acute angle between the two planes.

$$\vec{n_1} = \begin{pmatrix} -4 \\ 1 \\ -2 \end{pmatrix} \quad \vec{n_2} = \begin{pmatrix} 4 \\ 2 \\ -3 \end{pmatrix} \quad \cos\theta = \frac{|\vec{n_1} \cdot \vec{n_2}|}{|\vec{n_1}|\,|\vec{n_2}|}$$

A	$\cos^{-1}\left(\frac{8}{\sqrt{21}\sqrt{29}}\right)$	B	$\cos^{-1}\left(\frac{9}{\sqrt{21}\sqrt{29}}\right)$
C	$\sin^{-1}\left(\frac{8}{\sqrt{21}\sqrt{29}}\right)$	D	$\cos^{-1}\left(\frac{8}{\sqrt{50}}\right)$

11

Find the acute angle between the two planes.

$$\vec{n_1} = \begin{pmatrix} 2 \\ -2 \\ -1 \end{pmatrix} \quad \vec{n_2} = \begin{pmatrix} 1 \\ -2 \\ 4 \end{pmatrix}$$

A	$\sin^{-1}\left(\frac{2}{\sqrt{9}\sqrt{21}}\right)$	B	$\cos^{-1}\left(\frac{2}{\sqrt{9}\sqrt{21}}\right)$
C	$\cos^{-1}\left(\frac{3}{\sqrt{9}\sqrt{21}}\right)$	D	$\cos^{-1}\left(\frac{2}{\sqrt{30}}\right)$

12

Find the acute angle between the two planes.

$$3x - 2y - 4z = 1$$
$$-3x + 4y + z = -4$$

A	$\cos^{-1}\left(\frac{22}{\sqrt{29}\sqrt{26}}\right)$	B	$\sin^{-1}\left(\frac{21}{\sqrt{29}\sqrt{26}}\right)$
C	$\cos^{-1}\left(\frac{21}{\sqrt{29}\sqrt{26}}\right)$	D	$\cos^{-1}\left(\frac{21}{\sqrt{55}}\right)$