次の 2 つのベクトルをなす角 θ を求めよ。 $0 \leq \theta \leq 180°$ とする

(1) $\vec{a} = (1, 2), \vec{b} = (-1, 3)$

(2) $\vec{a} = (3, -1), \vec{b} = (1, 3)$

(3) $|\vec{a}| = 4, |\vec{b}| = 3,$ 内積 $\vec{a} \cdot \vec{b} = 6\sqrt{2}$ → $\boxed{6\sqrt{2}}$ 考え

(4) $|\vec{a}| = 2, |\vec{b}| = 3,$ 内積 $\vec{a} \cdot \vec{b} = 3$

以下 なす角を θ とする

(1) $|\vec{a}| = \sqrt{1+4} = \sqrt{5}$, $|\vec{b}| = \sqrt{1+9} = \sqrt{10}$

$\vec{a} \cdot \vec{b} = 1 \cdot (-1) + 2 \cdot 3 = 5$

$5 = \sqrt{5} \cdot \sqrt{10} \cdot \cos\theta \quad \rightarrow \quad 5 = 5\sqrt{2} \cos\theta$

$\cos\theta = \frac{1}{\sqrt{2}} \qquad \theta = 45°$

(2) $|\vec{a}| = \sqrt{9+1} = \sqrt{10}$, $|\vec{b}| = \sqrt{1+9} = \sqrt{10}$

$\vec{a} \cdot \vec{b} = 3 \cdot 1 - 1 \cdot 3 = 0$

$0 = \sqrt{10} \sqrt{10} \cos\theta \qquad \cos\theta = 0 \qquad \theta = 90°$

(3) $4 \cdot 3 \cos\theta = -6\sqrt{2}$

$\cos\theta = -\frac{\sqrt{2}}{2} = -\frac{1}{\sqrt{2}} \qquad \theta = 135°$

(4) $2 \cdot 3 \cos\theta = 3$

$\cos\theta = \frac{1}{2} \qquad \theta = 60°$

数樂 http://www.mathtext.info/