

2) Given two vectors $\vec{A} = 2\mathbf{i} - 2\mathbf{j} + 2\mathbf{k}$ and $\vec{B} = \mathbf{i} - 4\mathbf{j} + \mathbf{k}$.

Calculate $\vec{A} \cdot \vec{B}$

$$\begin{aligned}\vec{A} \cdot \vec{B} &= (2)(1) + (-2)(-4) + (2)(1) \\ &= 2 + 8 + 2 = 12\end{aligned}$$

Find the angle between these two vectors.

$$\cos \theta = \frac{\vec{A} \cdot \vec{B}}{A B} = \frac{12}{\sqrt{12} \sqrt{18}}$$

$$\rightarrow \theta \approx \underline{\underline{35.3^\circ}}$$