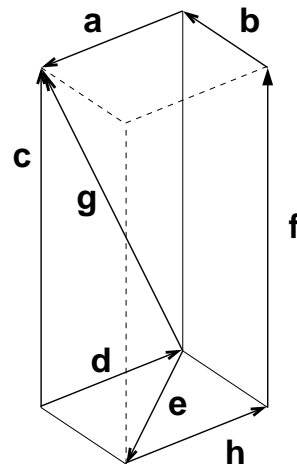


1. The figure at the right shows a rectangular box containing several vectors. Are the following statements true or false? Explain.

- (a) $\vec{c} = \vec{f}$
- (b) $\vec{a} = \vec{d}$
- (c) $\vec{a} = -\vec{b}$
- (d) $\vec{g} = \vec{f} + \vec{a}$
- (e) $\vec{e} = \vec{a} - \vec{b}$
- (f) $\vec{d} = \vec{g} - \vec{c}$



2. Compute the angle between the vectors $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} - \hat{j} - \hat{k}$.

3. Which pairs (if any) of vectors from the following list

- (a) Are perpendicular?
- (b) Are parallel?
- (c) Have an angle less than $\pi/2$ between them?
- (d) Have an angle of more than $\pi/2$ between them?

$$\begin{aligned} \vec{a} &= \hat{i} - 3\hat{j} - \hat{k} & \vec{b} &= \hat{i} + \hat{j} + 2\hat{k} \\ \vec{c} &= -2\hat{i} - \hat{j} + \hat{k} & \vec{d} &= -\hat{i} - \hat{j} + \hat{k} \end{aligned}$$