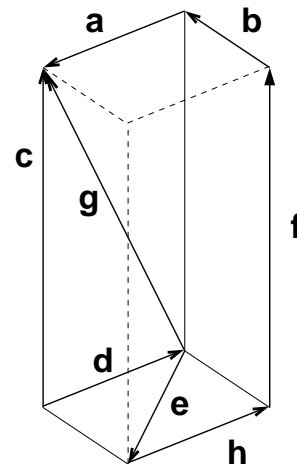1. The figure at the right shows a rectangular box containing several vectors. Are the following statements true or false? Explain.

(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 $\hat{\imath} + \hat{\jmath} + \hat{k}$ and $\hat{\imath} - \hat{\jmath} - \hat{k}$.

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?

$$\vec{a} = \hat{\imath} - 3\hat{\jmath} - \hat{k} \qquad \vec{b} = \hat{\imath} + \hat{\jmath} + 2\hat{k}$$
$$\vec{c} = -2\hat{\imath} - \hat{\jmath} + \hat{k} \qquad \vec{d} = -\hat{\imath} - \hat{\jmath} + \hat{k}$$