1. If $\vec{A} = (7, 3, 4)$ and $\vec{B} = (7, 8, 2)$,

(a) Find $\vec{A}_\parallel$, the piece of $\vec{A}$ parallel to $\vec{B}$.

(b) Find $\vec{A}_\perp$, the piece of $\vec{A}$ perpendicular to $\vec{B}$.

(c) Show by explicit calculation $\vec{A}_\parallel + \vec{A}_\perp = \vec{A}$.

(d) Show by explicit calculation $\vec{A}_\parallel \times \vec{B}$.

(e) Show by explicit calculation $\vec{A}_\perp \cdot \vec{B}$.

2. (a) What is the equation for the plane passing through the origin and perpendicular to the vector $\vec{C} = (1, 2, 3)$?

(b) What is the equation for the plane passing through the point $P = (4, 5, 6)$ and perpendicular to the vector $\vec{C} = (1, 2, 3)$?

3. A tetrahedron has vertices $(1,1,1); (1,-1,-1); (-1,1,-1); and (-1,-1,1)$.

(a) From your position at the origin, what is the angle between any two vertices?

(b) What is the area of one face?