Math 2071 - Linear Algebra and Matrices

Problem Set 1 – Chapter 1

Consider the four points through $A = (1, 1, 1)$, $B = (-1, -1, 1)$, $C = (1, -1, -1)$, and $D = (-1, 1, -1)$.

1. What is the displacement vector from A to B. What is the displacement vector from C to D. What is the angle between these two vectors.

2. Find the equation of the plane P through A, C, and D. Is B on that plane?

3. Find a vector which of length 1 and which is perpendicular to the plane P.

4. Let $\mathbf{R}$ be a vector for which $\mathbf{R} \cdot (1, 1, 1) = 1$, $\mathbf{R} \cdot (-1, -1, 1) = 1$, and $\mathbf{R} \cdot (1, -1, -1) = 1$. What is $\mathbf{R} \cdot (-1, 1, -1)$?