Show all work!

1. Let $\mathbf{a} = \mathbf{i} - 2\mathbf{j} + 2\mathbf{k}$, $\mathbf{b} = 3\mathbf{i} - 4\mathbf{k}$.
   (a) Find $\text{proj}_{\mathbf{a}}\mathbf{b}$.
   (b) Find $\text{proj}_{\mathbf{b}}\mathbf{a}$.
   (c) Find $\text{comp}_{\mathbf{a}}\mathbf{b}$.
   (d) Find $\text{comp}_{\mathbf{b}}\mathbf{a}$.
   (e) Find all unit vectors that are perpendicular to $\mathbf{a}$ and $\mathbf{b}$.
   (f) Find the cosine of the angle between $\mathbf{a}$ and $\mathbf{b}$.
   (g) Find the area of the parallelogram with edges $\mathbf{a}$ and $\mathbf{b}$.
   (h) Find the volume of the parallelepiped with edges $\mathbf{a}$, $\mathbf{b}$, and $\mathbf{c} = 2\mathbf{i} + \mathbf{j} + 2\mathbf{k}$,