You may use your graphing calculator, Maple, book and notes. All work is to be your own. Show your work: write sentences of explanation, show calculations, or indicate what you did on the calculator. Good luck!

1. (5 pt)
   Find \((\vec{i} + \vec{j} + \vec{k}) \times (\vec{i} \times \vec{j})\)

2. (20 pt) Let \(A = (1, 1, 1), B = (0, 2, 3), C = (1, 4, 7)\).
   (a) Find an equation of the plane through points A,B,C.
   (b) Find the length of the segment AB.
(c) Find the angle ACB.

(c) Find the area of triangle ABC.

3. (5pt) Find a vector parallel to the intersection of the planes $z+x+y = 1$ and $z = 3x-y$.

4. (5pt) Three forces are applied to an object to hold it in place. The first is 100 newtons applied in the direction 30 degrees west of north. The second force is 50 newtons applied in the direction 45 degrees east of north. What is the direction and the magnitude of the third force?