Summer 2014
Review Day 2

Planes, Vectors and Automobiles

1. Given a vector $\vec{v} = (a, b)$ the formulas for the following

(a) A unit vector parallel to $\vec{v}$

(b) A vector perpendicular to $\vec{v}$

(c) The magnitude of $\vec{v}$

2. Without looking at notes, write the geometric equations for dot product and cross product.

3. True or False: Is $(\vec{v} \times \vec{u}) \times \vec{w} = \vec{v} \times (\vec{u} \times \vec{w})$. If true, prove, if false, give a counter example.

4. Write an equation of the plane with normal vector n passing through the given point

(a) $n = \langle 1, 3, 2\rangle, (4, -1, 1)$

(b) $n = i, (3, 1, -9)$

5. Find an equation of the plane passing through the three points

(a) $(1, 2, 3), (3, 2, 1), (2, 1, 3)$

(a) $(0, 0, 0), (1, 0, 0), (2, 0, 0)$

6. Find the intersection of the line and plane

(a) $x + y + z = 14, r(t) = \langle 1, 1, 0\rangle + t\langle 0, 2, 4\rangle$

(b) $z = 12, r(t) = t\langle -6, 9, 36\rangle$

7. Compute the angle between the two planes

(a) $2x + 3y + 7z = 2$ **and** $4x - 2y + 2z = 4$

(b) The plane through $(1, 0, 0), (0, 1, 0), (0, 0, 1)$ **and the y-plane**