Name _____

Homework 4
Section 13.3

1. (3) Determine the equation of the plane which passes through $(2, 5, -3)$ and is normal to the vector $\vec{w} = 4\vec{i} - 6\vec{j} + \vec{k}$. Write your answer in the form $ax + by + cz = d$.

2. (2ea) Determine a vector which is normal to the following planes.

   (a) $2x + 3y - 5z = 30$

   (b) $z = 8x - 4y - 3$

3. (2) Find a unit vector that points from $(1, 9, -4)$ toward $(8, 3, -2)$.

4. (5) Compute the angle between the vectors $\vec{v} = 5\vec{i} - 2\vec{j} + 4\vec{k}$ and $\vec{w} = -\vec{i} + 3\vec{j} + 6\vec{k}$. Round to the nearest $0.1°$.

5. (3ea) Compute (and simplify) the dot product of the following pairs of vectors:

(a) $\vec{a} = 2t\vec{i} + 3\vec{j} - (5t+2)\vec{k}$ and $\vec{b} = (t-4)\vec{i} + (t^2+2t+1)\vec{j} + (t-1)\vec{k}$

(b) $\vec{F} = (y - \frac{2}{3}xy)\vec{i} - (x^3 - y)\vec{j} + (2y^2 - x^2y + y)\vec{k}$ and $\vec{n} = (3x^2)\vec{i} - (2y+1)\vec{j} + \vec{k}$