

Math 2633
Summer 2004 – Practice Test

NAME _____

1. Find an equation of the plane containing two parallel lines $\vec{v}_1 = (-3, 0, 2) + t(-1, 1, 3)$ and $\vec{v}_2 = (2, -2, 1) + t(3, -3, -9)$.
2. Find all pairs of cross products among $\vec{i}, \vec{j}, \vec{k}$.
3. Given the vectors $\vec{u} = 3\vec{i} - 2\vec{j} - 3\vec{k}$ and $\vec{v} = -\vec{i} - \vec{k}$ find the following:
 - a. The angle between \vec{u} and \vec{v} .
 - b. $\text{proj}_{\vec{v}}\vec{u}$
 - c. $\text{comp}_{\vec{v}}\vec{u}$
4. Identify and describe the surface given by:
 - a. $\frac{y^2}{4} + \frac{z^2}{3} - \frac{x}{5} = 0$
 - b. $x^2 = 3 + y^2 + z^2$
5. Find an equation of a line through the point $(3, 6, 7)$ and perpendicular to the plane $x - y = 3$.
6. Write the equation $x^2 - y^2 + z = 3$ in both cylindrical and spherical coordinates.
7. Do the planes given by the equations $x + y = z$ and $2x - 5y - z = 1$ intersect? If so, then find the equation of the line of intersection of the planes.
8. Find the area of the triangle whose vertices are $(2, 3, 1)$, $(1, 6, -7)$ and $(-2, -4, -5)$.
9. A force of magnitude 12 lbs. and a second force of magnitude 15 pounds act on the same object and make an angle of θ with each other. If the resultant force has a magnitude of 18 pounds, find θ .