Name _____

1. Let $b = <1, 1, 1>$ and $a = <1, 0, 1>$.
   i. Express b as $b = b1 + b2$ where $\mathbf{b1}$ is parallel to $\mathbf{a}$ and $b2$ is orthogonal to $\mathbf{a}$

   ii. Sketch the appropriate triangle labeling all the vectors mentioned above.

   iii. Find the angle between b and a

2. Find the equation of a plane that contains the point $(1, 0, -1)$ and is parallel to the plane $x + y + z = 14$.

3. Find the equation of a line that passes through the points $(-1, -2, 4)$ and $(4, 2, 1)$.

4.
   i. Find the equation of a plane through the points $(0, 0, 0), (1, 1, 1), (1, 2, 3)$.

   ii. Sketch the plane in the first octant.

5.) Graph the surface $y^2 - z^2 - x^2 = 0$

6. For $r(t) = (2\cos(t), 2\sin(t), t)$.

    a. Sketch the curve in R^3 and plot the points $t = 0, \pi/2, \pi, 2\pi$

    b. Find $r'(t)$

7.

    a. Sketch the region bounded by $z = \sqrt{(x^2+y^2)}$ and the plane $x = 1$.

    b. Write a parametric equation for that curve of intersection.

8. Sketch the region bounded by the cone whose angle in spherical coordiantes is given by $\phi(phi) = \frac{\pi}{6}$ and a sphere of radius 1.

9. Sketch $x^2 + y^2 - z + 1 = 0$

    Lab1 Assignment: We will meet in the lab on Monday, that lab is on the first floor, 2 doors down from the Math Office. Working in groups of at most two, you will redo the exam (it will be posted on the web) in Maple. By completing the computations in Maple during that period. The lab report will be due Wednesday 10/5 at 2 p.m. , not after.