

1. Let $b = \langle 1, 1, 1 \rangle$ and $a = \langle 1, 0, 1 \rangle$.
 - i. Express b as $b = b_1 + b_2$ where b_1 is parallel to a and b_2 is orthogonal to a
 - ii. Sketch the appropriate triangle labeling all the vectors mentioned above.
 - iii. Find the angle between b and a and $b \times a$
 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. For $r(t) = (2 \cos(t), 2 \sin(t), t)$.
 - a. Sketch the curve in R^3 and plot the points $t = 0, \pi/2, \pi, 2\pi$ and find and plot the tangent line at $t = \pi/4$
 - b. Find $r'(t), r''(t), T, N, B$
 - c. Write $r''(t)$ in terms of T, N
 6. redo example 1 p 946
 7. Do the 3 examples in the text on projectile motion.
 8. Find the equation of a plane that contains the point $(1, 0, -1)$ and is parallel to the plane $3x + 6y + 2z = 6$.
 9. Find the parametric equations of a line that passes through the points $(1, 2, 3)$ and $(0, 1, 3)$.
- V. Sketch the following:**
10. The surfaces that you did in the Hoemwork.
 11. For $r(t) = (t, \sqrt{2} \cos(t), \sqrt{2} \sin(t))$.
 - a. Sketch the curve.
 12. Sketch the surface $x^2 + y^2 - 9 = 0$
 13. Find the point where the line $x = t + 1, y = 2t, z = 3t$ and the plane $x + y + z = 1$ intersect.
 - 14.) Find the distance from the origin to the plane $x + 2y + 2z = 6$.