Calculus II

Assignment 1

1. (a) What does the equation $x = 4$ represent in $\mathbb{R}^2$? What does it represent in $\mathbb{R}^3$? Illustrate with sketches.

   (b) What does the pair of equations $y = 3, z = 5$ represent? In other words, describe the set of points (x, y, z) such that $y = 3$ and $z = 5$. Illustrate with a sketch.

2. Find a vector that has the same direction as vector $\langle -2, 4, 2 \rangle$ but has length 6.

3. Find an equation of the plane.
   The plane through the point $(5, 3, 5)$ and with normal vector $2\mathbf{i} + \mathbf{j} - \mathbf{k}$
   Hint : dot product.

4. Describe the motion of a particle with position as (x, y) varies in the given interval.
   $x = 3 + 2\cos t, y = 1 + 2\sin t, \pi/2 \leq t \leq 3\pi/2$
   Hint : treat t as angle θ

References : Calculus, 7th Edition, James Stewart