1. Know how to operate with vectors: Add, subtract, multiply by a scalar, dot product and cross product, orthogonal decomposition of one vector with respect to another vector, etc.

2. Be able to work problems about lines and planes like the problems in section 9.5.

3. Know how to work with vector-valued functions. Thus be able to:
   (a) Find the domain of a vector valued function
   (b) Determine if a vector-valued function has a limit at a point.
   (c) Determine if a vector-valued function is continuous at a point.
   (d) Differentiate and integrate vector-valued functions.
   (e) Calculate the various quantities associated with a curve, namely
       i. Tangent = velocity vector
       ii. Speed
       iii. Acceleration vector
       iv. Unit Tangent Vector
       v. Curvature
       vi. Tangential and normal components of the acceleration
       vii. Unit Normal vector

4. Know the definition of real-valued functions of 2 and 3 variables, and the definitions of "graph" of such functions.

5. Be able to find the contour diagram for a function \( f(x,y) \) and be able to find the level surfaces of functions \( f(x,y,z) \).

6. Be able to exhibit the graph of functions whose graphs are paraboloids, cones, planes, and spheres.