Study Guide for test #1
MA 242.601 and MA242.651

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1. NOTE: The material in sections 9.6 and 9.7 will NOT be covered on this test.
2. Know the definition of Cartesian coordinates in space.
3. VECTORS: Know how to work with vectors. This includes:
   (a) adding and subtracting, multiplying by a scalar, dot and cross products, and vector projections.
   (b) Know and be able to use Theorem 9.3.2 and the theorem in the LAST box on page 668 of your textbook.
4. Lines and planes - Section 9.5: Know the equations for lines and planes in space. Be able to work problems like those worked out in the textbook and in lecture. In particular, you should be able to work problems like problems 2-28 on pages 683-684.
5. Vector functions and space curves, Section 10.1:
   (a) Know the definition of a vector-valued function. Be able to determine the domain of a vector-valued function.
   (b) Know how to determine if a vector-valued function of t has a limit at a point t_0, and whether or not a vector-valued function of t is continuous at a point t_0.
   (c) NOTE: You will NOT be asked to sketch any curves on the test.
6. Section 10.2 - derivatives and integrals of vector functions.
   (a) Be able to compute derivatives and integrals of vector-valued functions.
   (b) Know the properties in Theorem 3 on page 714.
   (c) Be able to compute the unit tangent vector $\mathbf{T}$ for a given curve.
7. Section 10.3 - Arc length and curvature of a curve.
   (a) Be able to compute the arc length of simple curves as in Example 1, page 718, and problems 1-4 on page 723.
   (b) Know the definitions of curvature of a curve and unit normal vector of a curve, and be able to compute both quantities for a given curve.
   (c) NOTE: I will NOT ask you about the unit binormal $\mathbf{B}$ vector for a curve.
8. Section 10.4 - Acceleration.
   (a) Be able to compute the tangential a_T and normal a_N components of acceleration.
   (b) Be able to compute the curvature κ of the curve.