Exam 1 Information

You are encouraged to double check this document to make sure that I didn't leave anything off.

- **Section 12.1**
  - three dimension coordinate system
  - distance formula
  - cylindrical surfaces
  - plane
  - sphere
    - center
    - radius
    - completing the square
- **Section 12.2**
  - vectors: addition, subtraction, scalar multiplication, magnitude
  - unit vector
  - vector of a certain length
- **Section 12.3**
  - dot product
  - directional angles and directional cosines
  - scalar projection
  - vector projection
- **Section 12.4**
  - determinate of a 2X2 and a 3x3 matrix
  - cross product
    - both methods of calculating
    - right hand rule for direction
    - order is important
    - geometric interpretation: area of the parallelogram created by the vectors.
  - scalar triple product
- **Section 12.5**
  - lines in three dimension
    - vector equation of a line.
    - paramatric equations of a line
    - symetric equations of a line
    - determine if lines are parallel, intersecting, or skew.
  - planes
    - vector equation
    - cartesian queation
    - normal vector
    - parallel/perpendicular planes
    - distance from a point to a plane
    - distance between to parallel planes
- **Section 12.6**
  - quatratic surfaces
  - be able to identify the different types of equations.
- **Section 13.1**
  - vector functions/space curves
  - direction traveled when graphing
  - limitsof a vector function
  - what surface does the space curve lie on?
- **Section 13.2**
  - derivatives and integrals of vector functions
  - position, velocity, and acceleration
  - tangent vector at a point on a space curve
  - equation of a tangent line at a point of a space curve.
- **Section 13.3**
  - arc length both two and three dimension
  - arc length function
  - reparameterize a curve with respect to arc length from a particular point(i.e. usually $t = 0$).
  - curvature of a space curve three possible formulas
  - unit tangent vector function
- **Section 13.4**
  - position, velocity, acceleration function
  - unit tangent vector function
  - unit normal vector function

Any additional topic/information covered in these sections.