EXAM I REVIEW

TEXTBOOK REFERENCE:
- Vector Calculus, Colley, 4th Edition: §1.1-1.5, 1.7, 3.1, 3.3

TOPICS TO KNOW:

• dot product formulae, magnitude/length, displacement vectors, position vector
• cross product formulae, cross product properties, geometric applications of cross product (e.g. area of triangle, volume of parallelepiped)
• distance formulae: distance between points, distance from point to plane, distance between parallel planes.
• parametric description of a line
• equation of a plane, parametric description of a plane, normal vectors to a plane
• spherical, cylindrical, polar coordinate systems; coordinate transformations
• paths, image curves, velocity vectors, tangent lines
• vector fields, plotting vector fields, flow lines

COMPUTATIONS TO KNOW:

• How to compute the dot product using algebraic and geometric formulae.
• How to compute magnitude of a vector.
• How to compute the cross product.
• How to compute the distance between points.
• How to compute a parametric description of a line.
• How to compute the equation of a plane; how to compute a parametric description of a plane; how to compute a normal vector to a plane.
• How to transform equations between coordinate systems.
• How to compute velocity vectors.
• How to compute tangent lines.
• How to check if a path is a flow line for a vector field.