Math 2210-3
Friday Feb. 12

midterm is Wednesday

review sessions
Monday LCB 323 10:30 – noon
Tuesday SW 134 10:45 – noon

- cover §11.9 polar, cylindrical, spherical coords, Wednesday notes

then go over review sheet: (and fill in!)

Exam covers all of chapter 11. Closed book & closed note. In class, 10:45-11:45.
(but I will write RCE & curvature formulas on blackboard)
mostly computational but will also ask for some explanations

Topics

vectors and points basics
points in the plane & 3-space. Coordinate boxes, rectangles, line segments defined implicitly by equalities & inequalities in $x, y, z$
algebra and geometry of vector addition/subtraction, scalar multiplication, magnitude, $\hat{i}, \hat{j}, \hat{k}$

dot product
definition
algebraic properties

geometric formula
angle between vectors

equations of planes
finding a plane equation from various pieces of information

angles between planes

projection

components

work

cross product

definition

algebraic properties

geometric formulas

direction

magnitude

areas of parallelograms, triangles

volumes of parallelepipeds

vector-valued functions and parametric curves

showing a parametric curve lies on a curve of surface defined implicitly (as points satisfying eqtn(s))

parametric and implicit equations for lines

relate $dy/dx$ to $dy/dt$ & $dx/dt$ for a plane curve

differentiation rules for vector-valued fcns (sum, products, chain)

lengths of curves, arclength s

position vector, velocity (tangent) vector, acceleration vector.
how to compute, where to draw, geometric & physics meanings

unit tangent and normal vectors T & N. How to find.

curvature $\kappa$

circle of curvature

decomposition of acceleration into tangential & normal components
(Do you understand this formula, if reminded of its precise form?
Can you work with it in various ways, like on the extended
HW exercise in last assignment? Could you explain derivation?
Could you use it to explain formula(s) for curvature?)

quadric surfaces, cylinders, surfaces of revolution

recognize.

use traces to sketch

show a parametric curve (or a point) lies on a surface

polar, cylindrical, spherical coordinates

how to go between these coordinate systems and rectangular coords