18.02 MINIMAL LIST OF TOPICS AND TECHNIQUES

UNIT 1

cross product, dot product, lines, planes, angles, parallel, perpendicular
solve a 3 by 3 system using an inverse matrix; know when this procedure works
velocity, acceleration, speed, arclength

UNIT 2

linear approximation, tangent plane, chain rule, directional derivative
contour plots, especially direction of the gradient
max/min; evaluate function at critical points, boundary points (including infinity)
differentiate with constraints; Lagrange multipliers

UNIT 3

evaluate multiple integrals; exchange order of integration
evaluate line integrals directly
Green's theorem in work form and in flux form (2-D flux definitely will be tested)
change of variable (Jacobian factor)

UNIT 4

volume/mass or average value
find potential functions and use them to evaluate line integrals (fundamental theorem)
3-D flux and divergence theorem
Stokes' theorem