

INSTRUCTIONS: Solve  $N - 1$  of the  $N$  problems; choose one problem to skip and put a big **X** in the corresponding box below. If you do not indicate which problem you are choosing to skip, I will assume that I should skip problem 9, which may hurt your grade. Show your work: even correct answers may receive little or no credit if a method of solution is not shown. You do not need to simplify your solutions. Graphing calculators, notes, cell phones, and other materials are not permitted.

Name:									
1	2	3	4	5	6	7	...	$N$	Total

Applications	Translations		Differentials
$A = \iint_R dA$	Rectangular $\rightarrow$ Cylindrical	Rectuangular $\rightarrow$ Spherical	$dV = \dots$
$V = \iint_R f(x, y) dA$	$x = r \cos \theta$	$x = \rho \sin \varphi \cos \theta$	$dx dy dz$
$V = \iiint_S dV$	$y = r \sin \theta$	$y = \rho \sin \varphi \sin \theta$	$r dz dr d\theta$
$m = \iiint_S f(x, y, z) dV$	$z = z$	$z = \rho \cos \varphi$	$\rho^2 \sin \varphi d\rho d\varphi d\theta$