

MATH 550 Section 001 Fall 2005 Bonus Project 2

(Due in Class November 17)

Let a be the largest digit among the last four digits of your student number and b be the smallest positive digit. Consider the triple integral

$$\iiint_W z^2 e^{x^2+y^2} dx dy dz,$$

where W is the region in the first octant ($x \geq 0, y \geq 0, z \geq 0$) bounded by the surfaces $x = 0, y = 0, x^2 + y^2 + z^2 = a, x^2 + y^2 + z^2 = b$ and $x^2 + y^2 = z^2$.

- (a) Plot the region W . (Helpful Maple commands: **with(plots), plot3d, display.**)
- (b) Find a numerical value for the integral. (Helpful Maple commands: **int, evalf.** More information on numerical integration can be found under **int[numerical].**)

Your solution should include several plots for (a) and the answer to (b), with detailed explanations of how you obtained your answer. You should include a neat Maple worksheet containing the relevant computations.