

Name:

Math 241, Section F1H, Fall 2007  
Graded HW Assignment 7, Due 10/15/07

1. **Problem 11.8:63.** This problem asks for the equations of a torus in rectangular, cylindrical and spherical coordinates. As always, just writing down such equations won't earn credit. You need to clearly show how you arrived at them. Here is a hint: First derive the equation in cylindrical coordinates, using a  $z - r$  plot, then convert this equation into rectangular and spherical coordinates using appropriate conversion formulas. (The resulting equations should be simplified as much as possible; in particular, they should not involve inverse trig functions.)
2. **Problem 13.M:37.** This is an example of the average value interpretation of an integral. In this case the region is a disk, and the function to be averaged is the distance from a point inside the disk to a fixed point on the boundary. It might be tempting to center the disk at the origin, but this leads to tricky integrals which you'll likely not be able to do. Instead, position the disk such that the origin is a boundary point of the disk by centering it at  $(a, 0)$ , and use polar coordinates to express this off center disk. (Note that, in contrast to disks centered at the origin, the polar coordinate limits for an off center disk are not constant.)

### Problems

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|-------------|-------------|
| 1. 11.8:39  | 13. 13.4:29 |
| 2. 11.8:43  | 14. 13.4:34 |
| 3. 11.8:45  | 15. 13.4:36 |
| 4. 11.8:47  | 16. 13.4:41 |
| 5. 11.8:51  |             |
| 6. 11.8:60  | 17. 13.5:7  |
| 7. 11.8:61  | 18. 13.5:15 |
| 8. 11.8:63  | 19. 13.5:26 |
|             | 20. 13.5:31 |
| 9. 13.4:9   | 21. 13.5:33 |
| 10. 13.4:13 |             |
| 11. 13.4:17 | 22. 13.M:37 |
| 12. 13.4:27 |             |