Math 223

Week 13 Homework due Tuesday, November 23

Sections 13.6, 13.7

Section 13.6, problems 3, 11, 17, 19, 21, 29, 33, 35, 37, 39

Hints:

3. Think of this as $z = y^2 - x^2$

17. Let the represent the x and z values and solve for y in terms of these, given that $y \geq 0$ is required.

19. Use either cylindrical or spherical coordinates. You must work out the intersection of the cone and the sphere to see the boundary of the surface and decide what the range of the variables must be. See problem 16, Section 13.7, which I worked out in class.

21. Express y and z using a single parameter θ, then express x in terms of another parameter t.

33. Let the parameters represent x and y, then solve for z. First octant is where $x, y, z \geq 0$.

35. Let the parameters represent x and y.

37. x and y lie within a circle of radius 1, so cylindrical coordinates are appropriate here.

39. x and y lie between a circle of radius 1 and a circle of radius 2, so cylindrical coordinates are appropriate here.

Section 13.7, problems 5, 7, 11, 13, 19, 23, 25, 33

Hints:

7. Let the parameters represent x and y.

11. The surface of a cone is created out of circles stacked on top of each other. Position in the cone is completely determined by height above xy-plane (first parameter) and angle about the z-axis (second parameter).

13. Given values of x and z, you can compute y. The (x, z) coordinates lie inside a circle of radius 4 in the xz-plane. Try $x = R\cos\theta$, $z = R\sin\theta$, then solve for y. Find the appropriate range of values for θ and R.

19. Let the parameters represent x and y.

23. Use spherical coordinates with $\rho = 2$.

25. Similar to #13. Note that the surface has two pieces to it, the paraboloid and the disk, so you will have to add two flux values together.

33. Use the equations on page 777.