Math 2210 - Assignment 11

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Section 13.8

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13.8.1 Evaluate the integral:

$$\int_0^{2\pi} \int_0^3 \int_0^{12} r\, dz\, dr\, d\theta$$

and describe the region of integration.

13.8.8 Find the volume of the solid bounded above by the sphere:

$$x^2 + y^2 + z^2 = 9,$$

below by the plane:

$$z = 0,$$

and laterally by the cylinder:

$$x^2 + y^2 = 4.$$

13.8.11 Calculate the volume of the solid bounded above by the sphere $r^2 + z^2 = 5$ and below by the paraboloid $r^2 = 4z$.

13.8.21 Calculate the volume of the smaller wedge cut from the unit sphere by two planes that meet at a diameter at an angle of $30°$.

13.8.23 Find the volume of the solid bounded above by the plane:

$$z = y$$

and below by the paraboloid

$$z = x^2 + y^2.$$

Hint: In cylindrical coordinates the plane has equation $z = r\sin\theta$ and the paraboloid has equation $z = r^2$. Solve simultaneously to get the projection in the xy-plane.