Study guide for quiz 12

Quiz problems include both the lecture contents and homework problems.

1. Section 15.7:

   Practice on drawing cross section $\{r = \text{constant}\}$, $\{\theta = \text{constant}\}$ and $\{z = \text{constant}\}$ in cylindrical coordinates. Which one is needed for $drd\theta dz$? which one is needed for $dzdrd\theta$? etc.

   On a cross section, the triple integral reduces to double integral for the first two integration variables. For example, on a $\{z = \text{constant}\}$ cross section, it reduces to double integral $drd\theta$. One can then follow item 4 above to determine the upper and lower limits of integration.

   Repeat the same practice in spherical coordinates.

   Also note that, the upper and lower limits of the first variable may depend on the second and third variables. The upper and lower limits of the second variable may depend on the third variable.

2. Section 15.8:

   Study the meaning of the Jacobian and memorize the formula both in double and triple integration.

3. Section 15.8:

   Suppose that a change of variables between (x, y, z) and (u, v, w) is given, study how to change the lower and upper limits of integration for (x, y, z) into lower and upper limits of integration for (u, v, w). See the examples in section 15.8.