Study guide for quiz 09

Quiz problems include both the lecture contents and homework problems.

1. Section 15.5:

   Practice how to determine the limits of integration for triple integrals in rectangular coordinates. For example, which cross section ($\{x = \text{constant}\}$, $\{y = \text{constant}\}$ or $\{x = \text{constant}\}$) is needed for $dxdydz$? which cross section is needed for $dzdxdy$? etc.

   On a cross section, the triple integral reduces to double integral for the first two integration variables.

   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.

   Practice this on corresponding examples and exercises in section 15.5.

2. 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.