Welcome to the Weekly Review for MATH 2451. This week’s review talks about Triple Integrals and Applications. We would like to thank Leszek Kisielewski and the Spring 2015 MATH 2451 students for allowing us to film the Weekly Reviews.

The following problems are presented in the video. Thank you!

**Part A: Triple Integrals**

1. Volume of a tetrahedron.

2. Find the volume of the tetrahedron which is the region of $\mathbb{R}^3$ in the first octant but below $2x + 2y + z = 4$
3. Evaluate \( \iiint_R ydzdx dy \) where \( R \) is a tetrahedron with coordinates \((0, 1, 0), (1, 1, 0), (2, 0, 0) \) and \((0, 1, 2)\).
4. Change of variables with three variables

5. Cylindrical Coordinates
6. Spherical Coordinates
7. Integrate over the region inside $x^2 + y^2 + z^2 = 4$ but outside $3z^2 = x^2 + y^2$ using cylindrical coordinates.
8. Integrate over the region inside $x^2 + y^2 + z^2 = 4$ but outside $3z^2 = x^2 + y^2$ using spherical coordinates.
Part B: Applications

1. Average Value
2. Mass

3. Center of Mass