MA114 Summer 2018
Worksheet 16 – Average Value and Volumes I – 7/10/18

1. Find the average value of the following functions over the given interval.

   a) $f(x) = x^3, [0, 4]$

   b) $f(x) = x^3, [-1, 1]$

   c) $f(x) = e^{-nx}, [-1, 1]$

   d) $f(x) = \dfrac{1}{1 + x^2}, [-1, 1]$

2. Calculate the volume of the following solid. The base is a square, one of whose sides is the interval $[0, l]$ along the x-axis. The cross sections perpendicular to the x-axis are rectangles of height $f(x) = x^2$.

3. Calculate the volume of the solid whose base is the unit circle $x^2 + y^2 = 1$ and whose cross sections perpendicular to the x-axis are triangle where the height and base are equal.