This week on the problem set we will see examples of integrals over more general regions.

You will only need to hand in a small selection of the questions for homework, however I recommend that you at least attempt them all by the end of the quarter as some may appear on exams!

Homework: due Friday 11 October, uploaded to Gradescope before 11:50pm. It will consist of questions:

$$16.1.49, 16.2.31, 16.2.48 \text{ (see below for the questions)}$$

Note that the references to the textbook are for the 4th edition, *late transcendentals* version. Any differences between the 3rd and 4th editions is noted in parentheses.

1. From 16.2 in the textbook: 4, 8, 14, 20, 21, 23, 29, 31, 45, 48, 49 (Question 21 is different in the two versions, but both are fine.).

2. From 16.3 in the textbook: 3, 5, 6, 7.

3. (16.1.49) (a) Which is easier, antidifferentiating $\dfrac{y}{1+xy}$ with respect to x or y? Explain.

   (b) Evaluate $\displaystyle\iint_{\mathcal{R}} \dfrac{y}{1+xy} \, \mathrm{d}A$, where $\mathcal{R} = [0,1] \times [0,1]$.

4. (16.2.31) Compute the integral of $f(x,y) = (\ln y)^{-1}$ over the domain $\mathcal{D}$ bounded by $y = e^x$ and $y = e^{\sqrt{x}}$. *Hint:* Choose the order of integration that enables you to evaluate the integral.

5. (16.2.48) Find the volume of the region bounded by $y = 1 - x^2$, $z = 1$, $y = 0$ and $z + y = 2$.