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: The first homework will be due on Friday 20 January, at 12pm, the *start* of the lecture. It will consist of questions:

$$16.1.47, 16.2.31, 16.2.48$$

Note that the references to the textbook are for the 3rd edition, *late transcendentals* version.

1. From 16.2 in the textbook: 4, 8, 14, 20, 21, 23, 29, 31, 45, 48, 49.
2. From 16.3 in the textbook: 3, 5, 6, 7.
3. (16.1.47) Evaluate $\int_0^1 \int_0^1 \frac{y}{1+xy} \, \mathrm{d}y \, \mathrm{d}x$, *Hint: Change the order of integration.*
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 $z + y = 2$.