MA 614 – Homework 19
Due Monday, Feb 28

Your answers should be detailed explanations in quality mathematical English. You must type your homework in LaTeX.

1. Prove the partition identity

$$\prod_{i\geq 1} \frac{1}{(1-xq^i)} = \sum_{k\geq 0} \frac{x^k q^k}{(1-q)(1-q^2)\cdots(1-q^k)} .$$

   NOTE and SUGGESTION: This is a multi-variable relative of the identity (1.77) on page 68 of EC1. From this, you know what the q's are recording. Contemplate what the x's are recording.

2. Prove the partition identity

$$\prod_{i\geq 1} (1+qx^{2i-1}) = \sum_{k\geq 0} \frac{x^{k^2} q^k}{(1-x^2)(1-x^4)\cdots(1-x^{2k})} .$$

   NOTE and SUGGESTION: This is a multi-variable relative of the identity (1.80) on page 69 of EC1. Contemplate Figure 1.16.