185B Homework 6

Question 1 State and prove the permanence principle.

Question 2 Use the product formula for the Gamma function to show

1. $\Gamma(z)\Gamma(1-z) = \frac{\pi}{\sin \pi z}$.

2. $\Gamma(\frac{1}{2}) = \sqrt{\pi}$.

3. $\frac{d}{dz} \log \Gamma(z) = -\frac{1}{z} - \gamma - \sum_{n=1}^{\infty} \left(\frac{1}{1+n} - \frac{1}{n} \right)$.