

# Homework 1

October 27, 2014

4. **(Homework)** Show that if  $x$  and  $y$  are two vectors in an inner product space such that  $\|x + y\| = \|x\| + \|y\|$ , then  $x$  and  $y$  are linearly dependent.
5. **(Homework)** Show the following version of polarization identity:

$$\langle x, y \rangle = \frac{1}{2\pi} \int_{-\pi}^{\pi} \|x + e^{i\theta} y\|^2 e^{i\theta} d\theta.$$