Homework 1

1. (10 + 10 points) Prove that any 2-coloring of K_7 has at least 4 monochromatic triangles. Provide a 2-coloring of K_7 exhibiting the tightness of this result.

2. (10 + 10 points) Prove that $\pi(x) = \Theta\left(\frac{\vartheta(x)}{\log x}\right)$.