Homework 1: 6.2-6.5

Directions: Do each of the following problems on your own paper. Calculators are allowed, but exact answers must be given unless otherwise specified and all answers must be supported analytically. Each problem is worth 10 points (5 pts for attempt).

1. Prove using the definition of the definite integral: \[ \int_a^b c f(x) \, dx = c \int_a^b f(x) \, dx. \]

2. Rewrite \[ \lim_{n \to \infty} \frac{3}{n} \sum_{i=1}^{n} \left( \left( 1 + \frac{3i}{n} \right)^3 - 4 \left( 1 + \frac{3i}{n} \right) \right) \] as an integral and evaluate.

3. Compute \[ \int \frac{e^x}{1 + e^{2x}} \, dx \]

4. Also hand in: 6.2 #23; 6.3 #25, 68; 6.4 #42, 53; 6.5 #44, 63