1. Assume $\lim_{x \to a} f(x)$ exists. Prove that if $c \in \mathbb{R}$, then $\lim_{x \to a} cf(x) = c \lim_{x \to a} f(x)$.

2. Assume $\lim_{x \to a} f(x) = L$ and $\lim_{x \to a} g(x) = M$, and $M \neq 0$. Prove that
$$\lim_{x \to a} \frac{f(x)}{g(x)} = \frac{L}{M}.$$ 

3. Assume $f$ is an even function on $[-b, b]$ and that $f$ is integrable. Prove that
$$\int_{-b}^{b} f(x)dx = 2 \int_{0}^{b} f(x)dx.$$ 

4. Assume $g$ is an odd function on $[-b, b]$ and that $g$ is integrable. Prove that
$$\int_{-b}^{b} g(x)dx = 0.$$ 

5. We proved in class that the Fibonacci numbers are given by the formula
$$F_n = \frac{(1 + \sqrt{5})^n - (1 - \sqrt{5})^n}{2^n \sqrt{5}}.$$ 

Evaluate
$$\lim_{n \to \infty} \frac{F_{n+1}}{F_n}.$$ 

6. How large must $n$ be to ensure that $\frac{F_{n+1}}{F_n}$ is within $10^{-1}$ of its limit? Within $10^{-2}$? Within $10^{-k}$?