

Homework 7

Compute the following limits using l'Hospital's Theorem:

$$\lim_{x \rightarrow 0} \frac{\tan 3x}{\sin 5x},$$

$$\lim_{x \rightarrow 0} \left(\cot x - \frac{1}{x} \right),$$

$$\lim_{x \rightarrow \infty} \frac{\ln(\ln x)}{x},$$

$$\lim_{x \rightarrow 0} \frac{x \sin^2 x}{x^2 - \sin^2 x},$$

$$\lim_{x \rightarrow 0} \frac{\ln(x^2 + 1)}{x},$$

$$\lim_{x \rightarrow (\pi/2)^-} (\sec x - \tan x),$$

$$\lim_{x \rightarrow 0} \left(\frac{1}{\sin x} - \frac{1}{x} \right),$$

$$\lim_{x \rightarrow 0^+} x^{\tan x}.$$