

CALCULUS I
AUTUMN 2015 - HOMEWORK 4

1. Use L'Hopital's rule to evaluate the below limits.

a) $\lim_{x \rightarrow \infty} \frac{2x^2 + 3x}{x^3 + x + 1}$ b) $\lim_{x \rightarrow 0} \frac{8x^2}{\cos x - 1}$

c) $\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}$ d) $\lim_{x \rightarrow 1} \frac{x - 1}{\ln x - \sin \pi x}$

2. Use L'Hopital's rule to evaluate the below limits.

a) $\lim_{t \rightarrow 0} \frac{t(1 - \cos t)}{t - \sin t}$ b) $\lim_{t \rightarrow 0} \frac{t \sin t}{1 - \cos t}$

c) $\lim_{x \rightarrow 0} \frac{3^x - 1}{2^x - 1}$ d) $\lim_{x \rightarrow 0^+} \frac{\ln(e^x - 1)}{\ln x}$

3. Find the below limits.

a) $\lim_{x \rightarrow 1^+} x^{1/(1-x)}$ b) $\lim_{x \rightarrow 0} (e^x + x)^{1/x}$ c) $\lim_{x \rightarrow 0^+} x^2 \ln x$