Millersville University
Department of Mathematics
MATH 161, *Calculus I*

Please use l'Hôpital's rule where appropriate to evaluate the following limits.

1. $\lim\limits_{x\to\pi/2} \dfrac{1-\sin x}{1+\cos 2x}$
2. $\lim\limits_{x\to 1} \dfrac{x-1}{\ln x - \sin \pi x}$
3. $\lim\limits_{x\to\infty} x \tan \dfrac{1}{x}$
4. $\lim\limits_{x\to 0^+} \left(\dfrac{1}{x} - \dfrac{1}{\sqrt{x}}\right)$
5. $\lim\limits_{x\to 1^+} (x^2 - 2x + 1)^{x-1}$
6. $\lim\limits_{x\to 1} x^{\frac{1}{1-x}}$
7. $\lim\limits_{x\to\infty} (1+2x)^{\frac{1}{2\ln x}}$
8. $\lim\limits_{x\to\infty} x^2 e^{-x}$
9. $\lim\limits_{x\to\infty} \displaystyle\int_x^{2x} \frac{1}{t}\, dt$
10. $\lim\limits_{x\to\infty} \dfrac{1}{x\ln x} \displaystyle\int_1^x \ln t\, dt$