SECTION 4.8 L'HÔPITAL'S RULE (DAY 1)

1. Give two functions $f(x)$ and $g(x)$ with the property that when you try to evaluate the limit as $x \to 1$ *by direct substitution* you get $0/0$ but that, in fact, $\lim\limits_{x \to 1} f(x) = 2$ and $\lim\limits_{x \to 1} g(x) = -14$.

2. Try to evaluate the following limits below by substitution. Use technology to draw the graphs and make a conjecture about what you think the limit should be.

   (a) $\lim\limits_{x \to 1/2} \dfrac{\cos(\pi x)}{1 - 2x}$

   (b) $\lim\limits_{x \to \infty} x \sin\left(\dfrac{\pi}{x}\right)$

   (c) $\lim\limits_{x \to 0^+} (1 + x)^{1/x}$

3. L'Hôpital's Rule says: