Name: _____

1. Use the first and second derivative test to sketch a plot of the following functions.

    (a) $y = x(6 - 2x)^2$

    (b) $y = \sin(x)\cos(x),\ 0 \le x \le \pi$

2. Use L'Hôpital's Rule to compute the following limits.

   (a) $\displaystyle\lim_{x\to 0} \frac{\sin(5x)}{x}$

   (b) $\displaystyle\lim_{x\to 0} \frac{\sin(x) - x}{x^3}$

   (c) $\displaystyle\lim_{x\to 0} \frac{x2^x}{2^x - 1}$

   (d) $\displaystyle\lim_{x\to\infty} \left(\frac{x+2}{x-1}\right)^x$

   (e) $\displaystyle\lim_{x\to 0} \frac{x - \sin(x)}{x\tan(x)}$

   (f) $\displaystyle\lim_{x\to 0} \frac{e^x - (1+x)}{x^2}$