Evaluate the following limits

Remember that to apply l'Hopital's rule you must check that the limit is in indeterminate form!
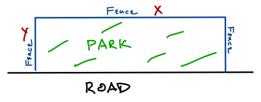
1. $\displaystyle \lim_{x \to 0} \frac{\sin(12x)}{5x}$

2. $\displaystyle \lim_{x \to \infty} \frac{e^x}{x^2 + 2x}$

3. $\displaystyle \lim_{x \to 0} \frac{\cos(3x)}{x}$

4. $\displaystyle \lim_{x \to \infty} x\,e^{-x}$

A city is planning to build a park along a major road. The park is to be rectangular with an area of 4000 square meters and will be fenced off on the three sides that are not adjacent to the road.

1. What is the least amount of fence required for this job?

2. What are the dimensions of the park in this case?