- 1. [9 points] Let $g(x) = x + ke^x$, where k is any constant.
 - **a.** [4 points] Write an explicit expression for the limit definition for the derivative of g(x) at x=2. Your expression should not include the letter 'g'. Do not evaluate your expression.

$$g'(2) =$$

b. [5 points] Find all values of k for which the function g(x) has a critical point. Do not try to use your answer from (a).

2. [5 points] A piece of wire of length L is cut into two pieces. One piece of length x cm is made into a circle and the rest is made into a square. Write an expression for the sum of the areas, A, of the circle and square in terms of the length L and the variable x. Do not optimize A.