- 1. (2 points each) For each of the following, circle all the statements which are **always** true. For the cases below, one statement may be true, **or** both **or** neither of the statements may be true.
 - (a) Let x = c be an inflection point of f. Assume f' is defined at c.
 - If *L* is the linear approximation to *f* near *c*, then L(x) > f(x) for x > c.
 - The tangent line to the graph of f at x = c is above the graph on one side of c and below the graph on the other side.
 - (b) The differentiable function g has a critical point at x = a.
 - If g''(a) > 0, then *a* is a local minimum.
 - If *a* is a local maximum, then g''(a) < 0.
 - (c) The derivative of $g(x) = (e^x + \cos x)^2$ is
 - $g'(x) = 2(e^x \sin x)(e^x + \cos x).$
 - $g'(x) = 2e^{2x} + 2(e^x \cos x e^x \sin x).$
 - (d) A continuous function f is defined on the closed interval [a, b].
 - f has a global maximum on [a, b].
 - *f* has a global minimum on [*a*, *b*].
 - (e) Consider the family of functions $e^{-(x-a)^2}$.
 - Every function in this family has a critical point at x = 0.
 - Some function in this family has a local maximum at x = 2.