(1.) (16 points) Indicate whether each statement is true or false. Circle TRUE only if the statement is *always* true.

(a) If $x = 4$ is a critical point of the function f, then $f'(4) = 0$.

TRUE FALSE

(b) If $g'(x) < 0$ for $x < 3$, $g'(x) > 0$ for $x > 3$, and $g'(3) = 0$, then g has a local minimum at $x = 3$.

TRUE FALSE

(c) If $f'(x)$ is defined for all x, then $f(x)$ is defined for all x.

TRUE FALSE

(d) It is possible to have a local minimum of f at $x = c$ if $f''(c) = 0$.

TRUE FALSE

(e) If $f'(3) = 6.4$ and $g'(3) = 2.3$, then the graph of $f(x) - g(x)$ has a slope of 4.1 at $x = 3$.

TRUE FALSE

(f) If $f(x)$ is increasing for all x, then $f'(x)$ is increasing.

TRUE FALSE

(g) For a revenue function, R, and a cost function, C, if $R(q_0) > C(q_0)$ and $MR < MC$ at $q = q_0$, a company would be advised to increase q.

TRUE FALSE

(h) The profit function is always maximized if marginal revenue equals marginal cost.

TRUE FALSE