1. (2 points each) Circle "True" if the statement is *always* true. Otherwise, circle "False." No explanation is necessary.

(a) Let f be a continuous function on the interval $[1, 10]$ and differentiable on $(1, 10)$. Suppose that $f(5) = 3$ and $f(2) = 1$. Then there is a point c in the interval $(2, 5)$ so that $f'(c) = \frac{2}{3}$.

True False

(b) If $g(x) = \frac{1}{f(x)}$, then $g'(x) = -\frac{1}{[f'(x)]^2}$.

True False

(c) If a is a local maximum for the function f on the interval $[2, 50]$, then $f'(a) = 0$.

True False

(d) If $g(x) = f^{-1}(x)$, then $g'(x) = (-1)f^{-2}(x)$.

True False

(e) The 100$^{\text{th}}$ derivative of $f(x) = x^5 + e^{2x}$ at $x = 0$ is 2^{100}.

True False

(f) If $f(x) = (x-1)(x-2)(x-3)(x-4)(x-5)(x-6)$, then $f'(x) = (x-1)+(x-2)+(x-3)+(x-4)+(x-5)+(x-6)$.

True False

(g) If f is continuous on $[a, b]$, then f has a global maximum and a global minimum on that interval.

True False