1. [10 points] For the following questions, circle "True" if the statement is **always** true, and otherwise circle "False". No justification is necessary.

a. [2 points] If $f(x)$ is a function with a local maximum at $x = c$, then $f'(c) = 0$.

> True   False

b. [2 points] If $g'(55) = g'(65) = 0$, then $g(x)$ is constant on the interval $55 \le x \le 65$.

> True   False

c. [2 points] The point $(\pi, 1)$ is on the curve defined by the implicit function $5 \sin(xy) = \ln(y)$.

> True   False

d. [2 points] The function $A(x) = \dfrac{1}{R^2} \cos(Rx) + \dfrac{1}{2}x^2$ has an inflection point at $x = 0$, where R is a nonzero constant.

> True   False

e. [2 points] If $h'(x) < 0$ for all x in the interval $[2, 8]$, then the global maximum of $h(x)$ on that interval occurs at $x = 2$.

> True   False