1. [12 points]
For the following statements, select True if the statement is *ALWAYS* true, and select False otherwise. No explanations are required.

a. [2 points] Suppose that f is a function whose second derivative is both continuous and positive everywhere. Then

$$f(2+\Delta x) > f(2) + f'(2)\Delta x.$$

True False

b. [2 points] Suppose that g is a continuous function and g' is defined for all x. Then g'' is also defined for all x.

True False

c. [2 points] If a continuous function H has exactly one local maximum and two local minima, then there are exactly three distinct values of x such that $H'(x) = 0$.

True False

d. [2 points] Suppose that A and B are two continuous functions such that $A'(x) \leq B'(x)$ for all x. Then $A(x) \leq B(x)$ for all x.

True False

e. [2 points] Suppose $P(x)$ is a continuous function satisfying $P'(x) \geq 0$ whenever $x > 0$. Then $P(a) \leq P(b)$ whenever $0 < a < b$.

True False

f. [2 points] If the functions R and S are inverses of each other, then R' and S' are inverses of each other.

True False