9. [10 points] For each of the statements below, circle TRUE if the statement is always true and circle FALSE otherwise. The letters \( a, b \) and \( c \) below represent real number constants. Any ambiguous marks will be marked as incorrect. No partial credit will be given on this problem.

a. [2 points] Let \( f(x) \) and \( g(x) \) be continuous functions which are defined for all real numbers. If \( f(x) \geq g(x) \) for all real numbers \( x \), then \( \int_a^b f(x) \, dx \geq \int_a^b g(x) \, dx \) whenever \( a < b \).

[ ] True [ ] False

b. [2 points] If \( a \) is a positive, then the function \( h(x) = \frac{\ln(ax^2)+x}{x^2} \) is an antiderivative of \( j(x) = \frac{2-\ln(ax^2)}{x^2} \).

[ ] True [ ] False

c. [2 points] Suppose a differentiable function \( \ell(x) \) is concave down and defined for all real numbers. If \( a < b \), then
\[
\frac{\ell(b) - \ell(a)}{b - a} < \ell'(b).
\]

[ ] True [ ] False

d. [2 points] If \( x = a \) is a critical point of a function \( m(x) \), then \( m'(a) = 0 \).

[ ] True [ ] False

e. [2 points] If \( n(x) \) and \( p(x) \) are continuous functions which are defined for all real numbers, then
\[
\int_a^b \left( c n(x) - p(x) \right) \, dx = c \int_a^b n(x) \, dx + \int_b^a p(x) \, dx
\]

[ ] True [ ] False