5. [10 points] For each statement below, circle TRUE if the statement is *always* true; otherwise, circle FALSE. There is no partial credit on this page.

   a. [2 points] The function $\frac{\sin x}{x}$ has an anti-derivative.

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ True $\qquad\qquad$ False

   b. [2 points] $\frac{d}{dx} \int_x^{x^2} e^{t^2} dt = 4x^3 e^{x^4} - 2xe^{x^2}$.

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ True $\qquad\qquad$ False

   c. [2 points] The average of the function $f(x) = \frac{1}{x}$ from $x = 1$ to $x = 3$ is $\ln(\sqrt{3})$.

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ True $\qquad\qquad$ False

   d. [2 points] $\int_a^b f(x)dx$ is greater than or equal to at least one of LEFT(n), RIGHT(n), TRAP(n), or MID(n) regardless of what $f(x)$ or n is.

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ True $\qquad\qquad$ False

   e. [2 points] If $\int_a^b f(x)dx > 0$ then $f(b) > f(a)$.

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ True $\qquad\qquad$ False