8. [12 points] For each of the following statements, circle True if the statement is always true and circle False otherwise. No justification is necessary.

a. [2 points] If $f(x)$ is positive and continuous, then $F(x) = \int_{-e^x}^{0} f(t)dt$ is increasing for all x.

True False

b. [2 points] If $E(x)$ is an antiderivative of e^x then $\ln(E(x)) = E(\ln(x))$.

True False

c. [2 points] If $g(x)$ is concave up and increasing on $[a, b]$ then $\int_a^b g(x)dx <$Trap(5) $<$Right(5).

True False

d. [2 points] If $\int_0^1 p(x)dx > \int_0^1 q(x)dx$, then $p(x) > q(x)$ for every x in $[0, 1]$.

True False

e. [2 points] If $v(x)$ is a continuous even function, then $\int_{-2}^{2} v(x)dx = \int_0^4 v(x)dx$.

True False

f. [2 points] If $f(x)$ is a continuous function, and $F(x)$ is an antiderivative of $f(x)$, then $F(x) = \int_3^x f(t)dt + K$ for some constant K.

True False