1. (2 points each) Circle "True" or "False" for each of the following problems. Circle "True" only if the statement is *always* true. No explanation is necessary.

(a) $\log^{-1}(x) = \frac{1}{e^x}$.

True False

(b) If a function is continuous at a point a, then it must also be differentiable at a.

True False

(c) Suppose f is a continuous function on the interval $[5, 8]$ and that $f(5) = -2$ and $f(8) = 3$. Then f has a zero on the interval $(5, 8)$.

True False

(d) $\lim_{x \to 6} \frac{|x-7|}{x-7}$ exists and is equal to -1.

True False

(e) Suppose f is a continuous function and f is concave up on the interval $(-10, 10)$. If $f'(1) = -2$, it is possible that $f'(4) = -3$.

True False

(f) Suppose f is a continuous function, $f(1) = 6$, and $f'(x) > 0$ for all x between 0 and 5. Then it is possible that $f(4) = 6$.

True False