Suppose that \( f(x) \) is continuous at \( x = c \) and \( f(c) > 0 \). Show that there is a \( \delta > 0 \) such that \( f(x) > f(c)/2 \) for \( |x - c| < \delta \) and \( x \in \text{Dom}(f) \).

Proof. Since \( f \) is continuous at \( c \), given \( \varepsilon = f(c)/2 \) there is a \( \delta > 0 \) such that

\[
\text{if } |x - c| < \delta, x \in \text{Dom}(f) \text{ then } |f(x) - f(c)| < \varepsilon = f(c)/2.
\]

For such \( x \)

\[-f(c)/2 < f(x) - f(c) < f(c)/2\]

so

\[f(x) > f(c)/2.\]