**Problem statement** Suppose that \( f \) is the function defined by the formula

\[
f(x) = \left( \arctan \left( \ln \left( \sqrt{x} - 1 \right) \right) \right)^3.
\]

a) What are the domain and range of \( f \)? Answers should *not* be numerical approximations, but should be written if needed in terms of traditional constants such as \( \pi \) and \( e \).

b) If \( y = f(x) \), write a formula for \( x \) in terms of \( y \).