10. [11 points] An effective cleaning solution can be made by mixing vinegar and water. Starting with 2 liters of a solution that is one-half water and one-half vinegar, \( v \) liters of vinegar are added to the solution. Let \( C = g(v) \) be the concentration of vinegar in the resulting solution. That is, \( g(v) = \frac{\text{Total volume of vinegar}}{\text{Total volume of solution}} \) after \( v \) liters of vinegar are added.

a. [2 points] Find a formula for \( g(v) \).

Answer: \( g(v) = \)

b. [2 points] Describe, in the context of this problem, the behavior of \( g(v) \) as \( v \to \infty \).

c. [4 points] Find a formula for \( g^{-1}(C) \).

Answer: \( g^{-1}(C) = \)

d. [3 points] Find and interpret, in the context of this problem, \( g^{-1}(0.75) \).