Answer on Question #85026 – Math – Calculus

Question

The range of the function f, defined by
f(x)=e^(-x)/(1+x) on [0,∞[, is]−∞,0[.
Is the statement true or false?
Give a short proof or a counter example in
support of your answer.

Solution

Function e^{-x} on [0,∞[is always positive, has an upper bound 1 at x=0 and continually descending to 0. Function $1/(1+x)$ on [0,∞[has the same behavior.

Thus, multiplication of both functions yields the $e^{-x}/(1+x)$ is always positive, it has an upper bound 1 at x=0 and continually descending to 0. So, the range of the function f is]0,1].

Answer: False. The range is]0,1].