

**SOLUTION TO THE PROBLEM LEFT UNDONE IN LECTURE 12 ON
OCTOBER 14TH**

1. The function f is continuous on $[1, 3]$ and it satisfies $f(1) = 1$, $f(3) = 4$ and $f(5) = 2$. Show that f does not have an inverse function.

Solution:

Note that $f(1) = 1 < 2$ and $f(3) = 4 > 2$. Also, f is continuous on $[1, 3]$, so we can apply the intermediate value theorem:

By the intermediate value theorem, there is c in $(1, 3)$ such that $f(c) = 2$. Since c is in $(1, 3)$, it can not be equal to 5.

Since we have $f(c) = f(5)$, the function f is not one-to-one and therefore it does not have an inverse.