1. State Taylor’s Theorem with the Lagrange form of the remainder term.

2. (a) Let $f(x) = \frac{1}{1-x}$. By repeatedly calculating derivatives, write down the Taylor polynomial of degree $n$ of $f$ at 0, that is, $P_{n,0,f}(x)$. (You don’t need to do this formally by induction; once you have spotted the pattern, go with it.)

(b) Use the Lagrange form of the remainder term to show that if $0 < x < 1/2$ then $P_{n,0,f}(x) \to f(x)$ as $n \to \infty$. 