1. Find the third degree Maclaurin polynomial for $f(x) = \sqrt{1+x}$.

   Solution: Since $f(x) = (1+x)^{1/2}$, we have $f'(x) = (1/2)(1+x)^{-1/2}$, $f''(x) = (-1/4)(1+x)^{-3/2}$, and $f'''(x) = (3/8)(1+x)^{-5/2}$. So, $f(0) = 1$, $f'(0) = 1/2$, $f''(0) = -1/4$, and $f'''(0) = 3/8$, and the third-degree Maclaurin polynomial is

$$T_3(x) = 1 + (1/2)x - (1/4)x^2/2! + (3/8)x^3/3! = 1 + x/2 - x^2/8 + x^3/16$$