Assignment #1

EMT 121

July 9, 2009

1. A ball is dropped from a height of 16 feet and begins to bounce. The height of each bounce is $\frac{3}{4}$ that of the previous bounce. Find the total distance traveled by the ball.

2. Find the Maclaurin series for the given function.

   (a) $\ln(1+x)$

   (b) xe^x

   (c) $\sqrt[3]{1+x}$

   (d) $\sin x$

3. Find the radius of convergence of the following:

   (a) $f(x) = \displaystyle\sum_{n=0}^{\infty} \left(\frac{x}{2}\right)^n$

   (b) $f(x) = \displaystyle\sum_{n=0}^{\infty} \frac{n!x^n}{(n+1)!}$

4. Find the Taylor series centered at 4 for the function $f(x) = \sqrt{x}$, and find the radius of convergence.