Let

1. Prove by induction that for

(It is not necessary here to determine the derivatives from first principles.)

1. Write down the Taylor series for at
2. What is the radius of convergence of the power series in (b)?
3. Use Taylor polynomial of degree 5 to give an approximation to
4. Use the error term from Taylor’s Theorem to show that the error in (d) is at most. (Note that this is still not a particularly good approximation.)