

MATH 158 Assignment 6, Spring 2013

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Due Friday April 12th at 4:20 pm.

14.1 Taylor Polynomials

Exercises 3, 17, 18, 24, 33, 34, 45, 48.

Using the Taylor polynomial $P_4(x)$ for e^x about $x = 0$, calculate $P_4(1.5)$. This is an estimate for $e^{1.5}$. How many digits are correct? The Taylor polynomial $P_4(x)$ is more accurate for small x . For $|x| < 0.1$ show that the maximum error of $P_4(x)$ is less than 5×10^{-7} . To exploit this we can apply the identity $e^x = (e^{x/2})^2$ to divide x by 2 until $x < 0.1$ then use the Taylor polynomial $P_4(x)$. Apply this method to get a better approximation for $e^{1.5}$. How many digits are correct?

14.2 Infinite Sequences

Exercises 2, 5, 34, 36, 40, 49, 50.

14.3 Infinite Series

Exercises 2, 10, 12, 35, 36, 47, 48.

14.4 Series with Positive Terms

Exercises 4, 12, 13, 15, 33, 34, 52, 60.

14.5 Taylor Series

Exercises 2, 4, 22, 28, 31, 35, 36 and

Find the Taylor series for $\cos x$ about $x = 0$ and determine the radius of convergence R for $\cos x$. Compare this with the series for $\sin x$.