Even More Taylor Series!

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Announcements

1. Final exam next Wednesday at 8am.
2. If you're behind on any assignments, make sure to get them turned it before the final for credit.

Using the Remainder

Because the remainder term for a Taylor polynomial is defined to be

$$R_n(x) = p_n(x) - f(x)$$

We can say that the Taylor series for the function f centered at a will converge to f (on it's interval of convergence) if

$$\lim_{n\to\infty} R_n(x) =$$

This happens with most functions in this class.

Using the Remainder

Find the nth Taylor polynomial centered at 0, $p_n(x)$ for the function $f(x) = \cos(x)$, and the corresponding remainder term $R_n(x)$. Show that for any x, $\lim_{n\to\infty} R_n(x) = 0$.

Working with Taylor series

Here are some of the most important power series for you to know:

Working with Taylor series

Find the Maclaurin series for the function $f(x) = \cos(x^2)$. Use this to find $f^{(80)}(0)$.

Working with Taylor series

Example

Find the Taylor series centered at $x = 3$ for the function $f(x) = e^x$.

Example

Example

Use a Maclaurin series to find

$$\int_0^1 e^{-x^2}\, dx$$

(Your answer will be in the form of a convergent series).

Example