Derivatives and Integration of Series

Derivatives

Notice our derivative has one less term than the original series.

Whatever is valid for a polynomial is usually good for a series.

You can use Power and Chain rules for series. You are taking the derivative with respect to the variable x. n is a constant.

The interval and radius of convergence of the derivative are the same as the original series.

The endpoints may or may not be included.

Integration

dx

Find the following:

Now let’s use derivatives and integrals to find series for functions not easily written as