$$\boxed{10}$$

Sigma Notation

We're about to start looking at polynomials, which means we'll be working with sums of terms–sometimes many terms. Such sums are often written using a special notation known as "sigma notation". It's possible that you are already a master of sigma notation. If not, you can brush up with the material in this section. (At very least, you should try some of the exercises to make sure that you haven't gotten rusty.)

David Weathers wrote the original version of Sections 10.1-10.4. Johnny Watts started Sections 11.1-10.5, while Rachel McCoy made significant improvements to Section 10.5.

10.1   Lots of examples

In mathematics one often encounters sums everywhere. Sometimes these sums have very few terms, but occasionally the sums can reach hundreds, thousands or even an infinite number of terms. In these cases, rather than listing each and every term or listing the first several terms and assuming the pattern is obvious, one can represent a sum using **summation notation**, often referred to as **sigma notation**.

Sigma notation has four main parts: the *index variable*, the *starting value*, the *final value* and the *formula*. These parts are illustrated in the following example.

Example 10.1.1. Consider:

$$\sum_{i=1}^{10}(i+2)$$

302