

### Project 12.2c: More Sequences and Series

#### **Objective**

To continue investigating sequences and series using Maple.

#### **Narrative**

If you have not already done so, do Project 12.2b.

In this project we investigate:

- a) the sequence  $\{a_n\} = \left\{\frac{1}{n^2}\right\}$  and the associated series  $\sum_{n=1}^{\infty} \frac{1}{n^2}$ ,
- b) the sequence  $\{a_n\} = \left\{\frac{1}{n}\right\}$  and the associated series  $\sum_{n=1}^{\infty} \frac{1}{n}$ , and
- c) the sequence  $\{a_n\} = \left\{\frac{(-1)^{n+1}}{n}\right\}$  and the associated series  $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n}$ .

#### **Task**

Repeat Project 12.2b using:

- a) the sequence  $\{a_n\} = \left\{\frac{1}{n^2}\right\}$ ,
- b) the sequence  $\{a_n\} = \left\{\frac{1}{n}\right\}$ , and
- c) the sequence  $\{a_n\} = \left\{\frac{(-1)^{n+1}}{n}\right\}$ .

#### **Comments**

Some other interesting sequences you might want to investigate include  $\{a_n\} = \left\{\frac{1}{n!}\right\}$ ,  $\{a_n\} = \left\{\frac{1}{n^n}\right\}$ , and  $\{a_n\} = \{1 + (-1)^n\}$ .