

Structures and Patterns questions

Simple CIII

The transcendental number e can be expressed as an infinite series, known as the Maclaurin Series.

$$e = 1 + \frac{1}{1} + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \dots$$

where $n! = 1 \times 2 \times 3 \times \dots \times n$. For example $6! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 = 720$. Use this series to find the value of e correct to 4 decimal places.

Complex CIII

Find the sum of the following

$$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \dots + \frac{1}{\sqrt{99} + \sqrt{100}}$$