2.3 Series

Exercises

1. Find the sums of the following series.

    (a) $\sum_{n=0}^{\infty} \left(\frac{3}{4}\right)^n$

    (b) $1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \ldots$

    (c) $\sum_{n=0}^{\infty} \left(-\frac{1}{4}\right)^n$

    (d) $1 - \frac{1}{2} + \frac{1}{2^2} - \frac{1}{2^3} + \ldots$

2. Suppose that, because of inflation, euro declines in its purchasing power by 0.5% a year. If the value in euros of GDP of a country remains constant over years, what is the purchasing power of all the following years together compared to the purchasing power of the actual year alone?

3. Study the nature (convergent or divergent) of the following series.

    (a) $1 + \frac{1}{2^3} + \frac{1}{3^3} + \ldots$

    (b) $1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \ldots$

    (c) $\frac{1}{2} + \frac{1}{5} + \frac{1}{8} + \frac{1}{11} + \ldots$

    (d) $\frac{1}{4} + \frac{1}{7} + \frac{1}{10} + \ldots$

    (e) $\frac{1}{3} + \frac{4}{3^2} + \frac{9}{3^3} + \frac{16}{3^4} + \ldots$

    (f) $\frac{11}{2} + \frac{21}{2^2} + \frac{31}{2^3} + \ldots$