

## Sequences

1. Write a formula for the general term:

a.  $2, 7, 12, 17, \dots$

b.  $\frac{1}{2}, \frac{1}{5}, \frac{1}{10}, \frac{1}{17}, \dots$

2. Determine whether the sequence converges. If so, find the limit:

a.  $\left\{ 1 + \left( \frac{9}{10} \right)^n \right\}_{n=1}^{\infty}$

b.  $\left\{ \frac{n^3}{e^{10}} \right\}_{n=1}^{\infty}$

c.  $\left\{ \sqrt[n]{2^{n+1}} \right\}_{n=1}^{\infty}$

3. Consider the sequence defined recursively by  $a_1 = \sqrt{2}$ ,  $a_{n+1} = \sqrt{2 + a_n}$  for  $n \geq 1$ .

Show that  $\sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2 + \dots}}}} = 2$ .