Sequences, growth and financial models

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the worked example, then show each step in the practice questions. Show the mathematical steps. A calculator, graphing tool or CAS may be used to check results where useful.

What you will practise

• Arithmetic and geometric sequences, first-order linear recurrence relations and financial mathematics

Useful starting skills: Year 10 algebra, percentages, statistical displays, geometry and trigonometry.

An arithmetic sequence adds a fixed amount each step: $u_n=u_0+nd$. A geometric sequence multiplies by a fixed factor: $u_n=u_0\,r^n$.

Define the starting index and period carefully. Growth factors above 1 increase positive values; factors between 0 and 1 model decay; negative factors alternate sign.

Worked example

$u_0=80$, $u_{n+1}=u_n+12$. Find u_5.

Five increments of 12 give $80+5\times12=140$.

Answer: 140.

Try it yourself

Name: _____ Date: _____

1. $u_0=7$, $d=4$. Give u_n and u_8.

2. $u_0=200$, $r=1.05$. Find u_3.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. $u_n = 7 + 4n$; 39.

Add 4 n times.

2. 231.525.

Three multiplications give $200(1.05)^3$.

Curriculum reference: General Mathematics Units 1–2 — Arithmetic and geometric sequences, first-order linear recurrence relations and financial mathematics

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