Loans, annuities and perpetuities

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. A scientific, statistical or financial calculator, or suitable spreadsheet, can support these calculations. Record the formula, inputs and interpretation.

What you will practise

- Reducing balance loans
- Annuities and perpetuities

Useful starting skills: Relevant General Mathematics Units 1–2 arithmetic, algebra, statistics, matrices and networks.

For end-of-period repayments A at interest i per period, balance $B_{n+1}=(1+i)B_n-A$. Interest is calculated before each repayment.

A payment first covers interest; the remainder reduces principal. For a level perpetuity with payments after interest, capital $P=A/i$ keeps the balance constant.

Worked example

A $10000 loan charges 1% per month and receives $600 at month-end. Find first interest, principal reduction and balance.

Interest $10000\times0.01=100$

principal reduction $600-100=500$

balance $10000+100-600$.

Answer: $100; $500; $9500.

Try it yourself

Name: _____ Date: _____

1. A loan balance is $9500 at the start of month 2. Interest is 1% per month and the end-month repayment is $600. Find the interest and closing balance for month 2.

2. Write recurrence for a $30000 annuity earning 0.4% monthly and paying $500 at month-end.

Answers and explanations

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

1. $95; $8995.

Start 9500; interest 95; subtract 600.

2. $B_0=30000$, $B_{n+1}=1.004\ B_n-500$.

The withdrawal is subtracted after interest.

Curriculum reference: General Mathematics Units 3–4 — Reducing balance loans; General Mathematics Units 3–4 — Annuities and perpetuities

Independent original resource. Not published or endorsed by VCAA. This focused set supports the listed skills; it is not a complete course or an official assessment.

This free preview may be shared intact with attribution. Not for sale.