Iterate a matrix recurrence and recognise an eventual steady state in a regular process.

Key skills | Free preview

Learning target: Iterate a matrix recurrence and recognise an eventual steady state in a regular process.

Matrix-capable technology can generate many states quickly, but a clear state convention and a correct update order are essential. A table exposes convergence more clearly than a single large power. Verify an early step manually and check preserved quantities such as a closed population total. Apparent numerical steadiness should be interpreted relative to a stated tolerance. Abstraction keeps state totals and transition rates; decomposition separates inputs, iteration and checking.

Try the mathematics

Task 1. Enter T=[[0.75,0.25],[0.25,0.75]] and column S0=[[160],[40]] in a matrix tool. Generate S(n+1)=TS(n) for n=0–4, then compare with T^5 S0. State the expected states.

Continue with the full worksheet

The complete resource has 2 focused task sets and substantive worked solutions. Use an exercise book or print the A4 worksheet. This preview shows the first task without its full solution.

Find this resource:
https://resources.aspiretopowerlearning.com.au/vce/skills/aspire-internal-gm-u34-o1-aos2-matrices-ks-01/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). General Mathematics; Units 3–4; Outcome 1; Key skills; Matrices; bullet 1; p. 91.

The learning target is a concise paraphrase. Aspire reference: aspire-internal-gm-u34-o1-aos2-matrices-ks-01. This is an internal identifier, not an official VCAA code.

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