Design and implement algorithms and simulations with suitable technology functions

Key skills | Free preview

Learning target: Design and implement algorithms and simulations with suitable technology functions.

Investigate $P' = 0.2P(1-P/1000)$, $P(0)=100$, with the exact benchmark $P(t)=1000/[1+9e^{(-0.2t)}]$. A numerical table, symbolic derivative and graph answer different questions. Keep step size, initial values and domain constraints visible. The listed checkpoints support verification of your implementation and are not a claim about an unseen software run.

Try the mathematics

Task 1. Simulate uncertainty in the initial population: choose P_0 uniformly from {80,100,120}, then take one Euler step with h=1. Implement 3000 repetitions. Trace choices generated by U=0.1,0.8,0.4 through index floor(3U), and give the theoretical mean benchmark.

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/sm-u34-o3-ks-08/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 3; Key skills; bullet 8; p. 116.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o3-ks-08. This is an internal identifier, not an official VCAA code.

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