Understand how specific and general formulations lead to analytical results

Key knowledge | Free preview

Learning target: Understand how specific and general formulations lead to analytical results.

An illustrative population is modelled by $P'=0.2P(1-P/1000)$, with $P(0)=100$ and time measured in weeks. The population observations supplied here are invented for mathematical practice. Compare model behaviour, numerical approximations and contextual conclusions while keeping the model's assumptions separate from the example data.

Try the mathematics

Task 1. Given $P(t)=1000/[1+9e^{(-0.2t)}]$, explain its connection with $P(0)=100$. State the general form for $P'=rP(1-P/K)$, initial value $0<P_0<K$, and interpret the constant.

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-o2-kk-02/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 2; Key knowledge; bullet 2; p. 115.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o2-kk-02. This is an internal identifier, not an official VCAA code.

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