Establish mathematical results through proof

Key skills | Free preview

Learning target: Establish mathematical results through proof.

Consider an illustrative river 120 m wide. Water flows east at 1.5 m/s, and a boat can move at 2.5 m/s relative to the water. North points directly across. Ignore acceleration and bank effects. A different navigation objective can change the best heading, so state the required landing condition.

Try the mathematics

Task 1. Prove the directly-opposite heading has westward angle arcsin(1.5/2.5) from north. Prove that aiming due north gives the minimum crossing time if eastward drift is unrestricted.

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-u2-o2-ks-04/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Unit 2; Outcome 2; Key skills; bullet 4; p. 70.

The learning target is a concise paraphrase. Aspire reference: sm-u2-o2-ks-04. This is an internal identifier, not an official VCAA code.

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