When sin x is approximately x

Key knowledge | Free preview

Learning target: Understand the small-radian-angle approximation sin(x) approximately equals x.

The approximation sin x≈x requires x in radians and becomes more accurate as x approaches zero. It is a local approximation, not an identity. Compare the approximation with a more precise value and report the absolute error in the output. Degree-mode calculator entries can produce a completely different result if the angle unit is overlooked.

Try the mathematics

Task 1. For x=0.04 radians, use sin x≈x. Compare with sin(0.04)≈0.0399893342 and find the absolute error and approximate percentage error relative to the given sine value.

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-mm-u2-o1-kk-02/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Mathematical Methods; Unit 2; Outcome 1; Key knowledge; bullet 2; p. 54.

The learning target is a concise paraphrase. Aspire reference: aspire-mm-u2-o1-kk-02. This is an internal identifier, not an official VCAA code.

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