Understand linear combinations of random variables

Key knowledge | Free preview

Learning target: Understand linear combinations of random variables.

Multiplying one random outcome is different from adding independent outcomes. Expectations respond linearly, but variability depends on whether repeated terms represent the same observation or independent observations. Write the full probability distribution before applying moment formulas, especially when comparing a scaled variable with a sum.

Try the mathematics

Task 1. X takes 0 and 2 with equal probability. Find E(X), Var(X) and SD(X). Find the distributions of 2X and X_1+X_2 for independent copies X_1,X_2.

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-o1-kk-01/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Unit 2; Outcome 1; Key knowledge; bullet 1; p. 69.

The learning target is a concise paraphrase. Aspire reference: sm-u2-o1-kk-01. This is an internal identifier, not an official VCAA code.

Free preview: share intact with attribution, without charging. Full resource rights are not included.

Original independent practice. Not published or endorsed by VCAA. The activity is not an official SAC, examination or complete treatment of every clause of a broad curriculum requirement.