Understand shortest paths and Dijkstra’s procedure.

Key knowledge | Free preview

Learning target: Understand shortest paths and Dijkstra’s procedure.

Dijkstra’s algorithm progressively finalises the smallest tentative distance from a starting vertex. Each finalisation tests whether travelling through that vertex improves neighbouring distances. Record predecessors as well as distances so a route can be reconstructed. The standard procedure assumes non-negative edge weights; an unreachable vertex keeps infinite distance rather than receiving an invented route.

Try the mathematics

Task 1. Run Dijkstra from A on the undirected network AB=4, AC=2, BC=1, BD=5, CD=7, CE=3, ED=1. Show finalised vertices and any changed tentative distances.

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-internal-gm-u34-o1-aos2-networks-kk-05/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). General Mathematics; Units 3–4; Outcome 1; Key knowledge; Networks and decision mathematics; bullet 5; p. 92.

The learning target is a concise paraphrase. Aspire reference: aspire-internal-gm-u34-o1-aos2-networks-kk-05. 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.