Solve shortest-path problems by inspection or Dijkstra’s algorithm.

Key skills | Free preview

Learning target: Solve shortest-path problems by inspection or Dijkstra’s algorithm.

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-ks-05/

Study-design reference

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

The learning target is a concise paraphrase. Aspire reference: aspire-internal-gm-u34-o1-aos2-networks-ks-05. This is an internal identifier, not an official VCAA code.

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