

Networks: worked examples

HSC Mathematics Standard 2

These examples show assessable skills, not an official HSC topic weighting or prediction. The 2024 NSW syllabuses have their first HSC examination in 2027; students sitting the 2026 HSC continue under the applicable 2017 syllabus.

Worked example 1 | 2 marks

Catalog reference: std2_bar25_unique_shortest_path_weight | seed 41001 | mapping std2-n2-2

Unique shortest route

Four candidate routes connect \$A\$ to \$H\$. Route ABEFH contains an edge of weight \$x\$ and has a further 27 minutes of travel.

Candidate route times

Route | Time excluding x (minutes) | Complete fixed time (minutes)

ACEGH | not applicable | 37

ABEGH | not applicable | 35

ABDFH | not applicable | 36

ABEFH | 27 | x plus the fixed time

(a) If ABEFH must be the unique shortest route, find the largest whole-number value of x . [2 marks]

Answer: 7

Shortest Path: 35

Integer Inequality: 7

Worked example 2 | 4 marks

Catalog reference: std2_kil25_project_schedule_new_activity | seed 41001 | mapping std2-n3-1

Project scheduling

The activity table gives predecessors and completion times. A proposed activity \$J\$ must follow \$F\$ and finish before \$I\$ begins.

Activity schedule

Activity | Predecessor | Duration (days)

A | Start | 27

B | Start | 9

F | B | 3

C | B | 15

G | A | 18

I | C F G | 24

(a) Find the minimum project completion time. [1 mark]

Answer: 69

Critical Path Forward Pass: 69

(b) Find the latest start time of activity \$C\$. [1 mark]

Answer: 30

Latest Start Time: 30

(c) Find the maximum duration of \$J\$ without delaying the project. [2 marks]

Answer: 33

Precedence Window: [12,45]

Activity Duration: 33

Worked example 3 | 1 marks

Catalog reference: std2_sgs25_flow_cut_capacity | seed 41001 | mapping std2-n3-2

Capacity of a cut

The table lists the directed edges that cross Cut 1 from the source side to the sink side.

Edges crossing Cut 1

Edge	Capacity
A to D	4
B to E	5
C to F	7

(a) Find the capacity of Cut 1. [1 mark]

Answer: 16

Cut Capacity: 16

Source and methodology

Examples are deterministic curriq catalog generations from existing QDSL archetypes at the published fixed seed.

The generator copies only student-facing prompts, mark allocations, topic mappings, display tables or options, checked answers and marking-path results into this resource.

Official syllabus source:

<https://curriculum.nsw.edu.au/learning-areas/mathematics/mathematics-standard-11-12-2024/overview/course>

Teacher verification note: check the mathematics, notation, permitted technology and syllabus fit for your cohort before classroom or assessment use.