



**Test Papers
Hub.**

HSC Mathematics Standard 2 Practice Paper 1

Practice Examination

Reading time 10 minutes · Working time 2 hours 30 minutes · Section I: 15 multiple-choice · Section II: 85 marks · 100 marks in all

How to use this booklet

- Reading time – 10 minutes. Working time – 2 hours 30 minutes. Write using black pen. Calculators approved by NESA may be used.
- A reference sheet is assumed to be provided, as in the real examination. For questions in Section II, show relevant mathematical reasoning and/or calculations.
- Worked solutions follow the paper: every question has step-by-step working and a key takeaway.

SECTION I

15 marks · Attempt Questions 1 – 15

Allow about 15 minutes for this section. Choose the best answer for each question.

1. A cable network must connect towns A, B, C, D and E. The possible links and their costs (\$ thousand) are: A-B: 7, A-C: 11, A-D: 9, A-E: 9, B-C: 4, B-D: 4, D-E: 3. What is the minimum total cost of connecting all five towns?

- A 18
- B 47
- C 16
- D 21

2. A rectangle 19 cm by 11 cm has a 3 cm by 5 cm rectangle cut out of one corner. What is the perimeter of the remaining L-shape, in centimetres?

- A 194 cm
- B 44 cm
- C 60 cm
- D 76 cm

3. A scientist finds that the line of best fit for the height h (in cm) of a plant after d days is $h = 9 + 3d$. According to this model, how many days will it take the plant to reach 78 cm?

- A 32
- B 23
- C 26
- D 78

4. What is the median of the following data set? 20, 14, 13, 26, 21, 23, 16

- A $\frac{39}{2}$
- B 19
- C 21
- D 20

5. A vehicle bought for \$20000 depreciates by 12% per year using the flat-rate (straight-line) balance method. What is its value after 3 years, to the nearest dollar?

- A \$12800
- B \$7200
- C \$13629
- D \$13300

6. A five-number summary is: minimum 6, Q1 24, median 34, Q3 37, maximum 59. What is the range?

- A 53
- B 56
- C 13
- D 10

7. A car travels from town A to town B at an average speed of 30 miles per hour and returns along the same road at 45 miles per hour. What is its average speed for the whole round trip, in miles per hour?

- A 45
- B 36
- C 37.5
- D 39.5

8. What is 21.6×9 ?

- A 1944
- B 194.5
- C 194.4
- D 19.44

9. A network has these edges and distances (km): A-B: 6, A-D: 6, B-C: 2, B-D: 4, B-E: 10, C-D: 2, C-E: 9, D-E: 7. What is the length of the shortest path from A to E?

- A 15
- B 5
- C 12
- D 13

WORKED SOLUTIONS

Answers & worked solutions

Multiple-choice answer key

1	A	2	C	3	B	4	D	5	A	6	A
7	B	8	C	9	D	10	B	11	D	12	A
13	C	14	C	15	B						

SECTION I

1. A cable network must connect towns A, B, C, D and E. The possible links and their costs (\$ thousand) are: A-B: 7, A-C: 11, A-D: 9, A-E: 9, B-C: 4, B-D: 4, D-E: 3. What is the minimum total cost of connecting all five towns? [Minimum spanning tree]

Correct answer: A — 18

- Minimum spanning tree: repeatedly add the cheapest link that does not make a cycle (Kruskal).
- The cheapest connected network costs 18 thousand dollars.
- Why the other options are wrong:
- B (47): That adds ALL the links; you only need a spanning tree.
- C (16): The tree needs 4 edges to connect 5 vertices.
- D (21): This is the correct answer (18) plus 3: an extra 3 was added at the end of the calculation (an off-by-3 error).

LOS: General Mathematics

KEY TAKEAWAY

Minimum spanning tree: choose the cheapest edges that connect every vertex without forming a cycle.

2. A rectangle 19 cm by 11 cm has a 3 cm by 5 cm rectangle cut out of one corner. What is the perimeter of the remaining L-shape, in centimetres? [[Perimeter]]

Correct answer: C — 60 cm

- Slide the cut edges: the missing top and side are replaced by the two inner edges, which add up to the same length.
- So the perimeter equals the original rectangle's: $2 \times (19 + 11) = 60$ cm.
- Why the other options are wrong:
- A (194 cm): That is the area, not the perimeter.
- B (44 cm): The cut-out corner does not change the perimeter.
- D (76 cm): Cutting a corner keeps the perimeter the same.

LOS: Mathematics