EXAM PAPER

General Mathematics Unit 3 & 4 — Examination 2 (Practice 1)

PREVIEW
This file has the first 7 of the 14 questions in this paper. The rest is locked: it comes with a PrepNest plan, or with the paper itself for VCE.

Reading time: 15 minutes (no writing)
Writing time: 90 minutes
Total time: 105 minutes

SECTIONS IN THIS PAPER

- Data analysis — 36 min (calculator allowed)
- Recursion and financial modelling — 18 min (calculator allowed)
- Matrices — 18 min (calculator allowed)
- Networks and decision mathematics — 18 min (calculator allowed)

INSTRUCTIONS

You are not permitted to write during reading time — you may only read the paper and plan your approach. Answer every question you can. Write your working in the space provided for long-answer questions. Marking guidance and full explanations are provided in the separate answer key.

PrepNest

Data analysis

36 minutes • Calculator allowed

Question 1

(9 marks)

A nursery measures the height, in centimetres, of nine saplings. The results are shown in the table below.

Height of nine saplings

Sapling	1	2	3	4	5	6	7	8	9
Height (cm)	47	30	55	45	62	42	51	50	58

a. Write down the median height, in centimetres. 1 mark

b. Find the first quartile, the third quartile and the interquartile range. 2 marks

c. Show that this data set contains no outliers. 2 marks

d. Find the mean height, in centimetres, correct to two decimal places. 1 mark

e. The mean is lower than the median. Explain what this suggests about the shape of the distribution. 1 mark

f. A tenth sapling is measured and found to be 85 cm tall. Explain the effect of including this sapling on the median and on the mean. 2 marks

Question 2

(5 marks)

The scores on a test are approximately normally distributed with a mean of 68 and a standard deviation of 9.

a. Find the percentage of students with scores between 59 and 77. 1 mark

PrepNest

b. Find the standardised score of a student who scored 86. 1 mark

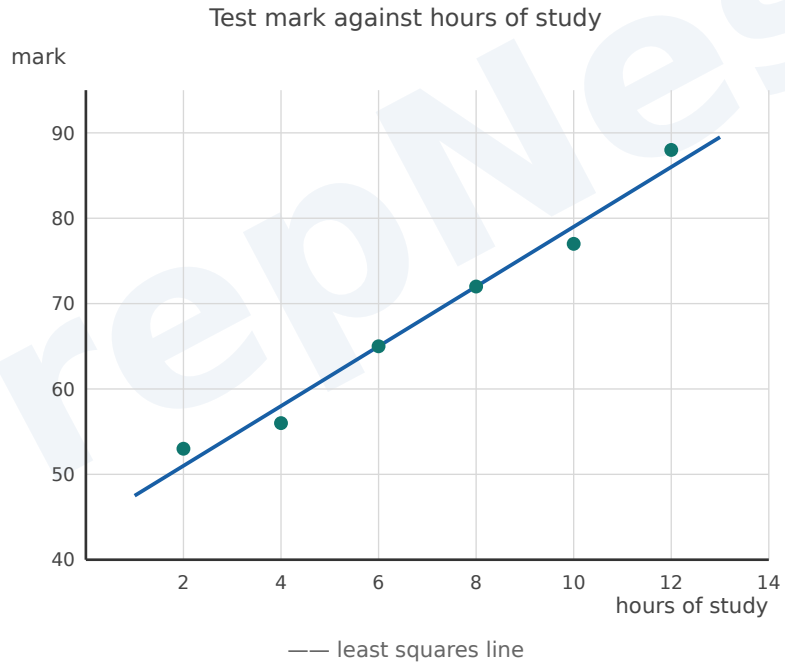
c. Using the 68–95–99.7% rule, find the percentage of students who scored above 86. 2 marks

d. In a group of 400 students, find the number expected to score below 50. 1 mark

Question 3

(6 marks)

The scatterplot below shows the test mark and the hours of study for six students, together with the least squares line fitted to the data. The equation of this line is mark = 44 + 3.5 × hours.



a. Name the explanatory variable in this study. 1 mark

b. Interpret the slope of the least squares line in terms of the variables in this study. 1 mark

c. Use the least squares line to predict the mark of a student who studies for 9 hours. 1 mark

PrepNest

d. Find the residual for the student who studied for 10 hours and scored 77. 2 marks

e. The coefficient of determination is 0.982. Interpret this value in terms of the variables in this study. 1 mark

Question 4

(4 marks)

The table below shows a company's sales, in thousands of dollars, for each quarter of one year.

Quarterly sales ($000)

Quarter	1	2	3	4
Sales	120	95	88	137

a. Find the mean quarterly sales figure for this year, in thousands of dollars. 1 mark

b. Show that the seasonal index for quarter 3 is 0.8. 1 mark

c. Find the seasonal index for quarter 4, correct to two decimal places. 1 mark

d. In quarter 4 of the following year, actual sales were $160 000. Using the index found in part c., find the deseasonalised sales figure, correct to the nearest thousand dollars. 1 mark

PrepNest

Recursion and financial modelling

18 minutes • Calculator allowed

Question 5 (3 marks)

A printer is purchased for $4800 and is depreciated using the reducing balance method at a rate of 20% per annum.

a. Write down a recurrence relation that models the value V_n, in dollars, of the printer after n years. 1 mark

b. Find the value of the printer after three years, correct to the nearest cent. 1 mark

c. Find the total depreciation over the first three years. 1 mark

Question 6 (4 marks)

Eli invests $15 000 in an account paying 5.2% interest per annum, compounding quarterly.

a. Find the quarterly interest rate. 1 mark

b. Find the value of the investment after five years, correct to the nearest cent. 2 marks

c. Find the total interest earned over the five years. 1 mark

Question 7 (5 marks)

Maya borrows $320 000 to buy a house. Interest is charged at 6% per annum, compounding monthly, and she makes repayments of $2100 at the end of each month.

a. Write down a recurrence relation that models the balance B_n, in dollars, of the loan after n months. 1 mark

PrepNest

b. Find the balance of the loan after two months, correct to the nearest cent. 2 marks

c. Find the total interest charged over these two months. 1 mark

d. Explain why the amount of interest charged decreases from one month to the next. 1 mark

PrepNest

LOCKED The rest of the paper comes with a PrepNest plan · prepnest.com.au/pricing

8.

9.

10.

PrepNest

LOCKED The rest of the paper comes with a PrepNest plan · prepnest.com.au/pricing

11.

12.

LOCKED The rest of the paper comes with a PrepNest plan · prepnest.com.au/pricing

13.

14.

7 questions locked, up to question 14.

PREVIEW

That’s the end of the preview

You’ve seen the first 7 of the 14 questions in General Mathematics Unit 3 & 4 — Examination 2 (Practice 1). The full paper is worth 60 marks.

STILL TO COME	QUESTIONS	MARKS
Matrices	4	12
Networks and decision mathematics	3	12

The full paper comes with

- Every question, printed exactly like the ones in this preview
- The complete answer key, with the working behind every mark
- A topic report after marking, showing what to practice next

Get the full paper at

prepnest.com.au/practice/exams/general_maths-year_12-1-exam2

PrepNest