BOARD OF STUDIES
NEW SOUTH WALES

1998 SCHOOL CERTIFICATE EXTERNAL TEST

17 November

MATHEMATICS

SECTION 2

PART B QUESTION & ANSWER BOOKLET

CENTRE NUMBER

STUDENT NUMBER

Directions for Section 2 – Part B

1 • You have 90 minutes to answer ALL of Section 2

• You should allow about 60 minutes to answer Part A and 30 minutes to answer Part B

2 Section 2 has TWO Parts

Part A:	Questions 26–75	(50 marks)
Part B:	Questions 76–80	(25 marks)

3 Attempt ALL questions in Section 2

4 Calculators may be used in Section 2

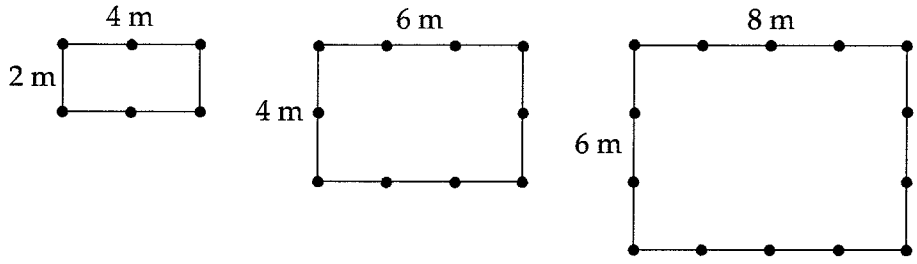
5 The Sample Questions & Formulae Booklet may be used in Section 2

6 Complete your answers to Section 2 Part B in this booklet

7 Do NOT write in pencil

8 Write your Centre Number and Student Number at the top of this page

QUESTION 76. (5 marks)



The diagrams show strips of land whose length and breadth each increase by 2 metres from the previous strip.
The dots represent posts placed 2 metres apart.
The numbers of posts needed to build fences around the strips of land form the pattern

6, 10, 14, . . .

(a) Draw the next strip of land to continue the pattern, clearly showing the posts.

(b) Complete this sentence to describe the pattern in words:

Beginning with the number 6, ...

.....

(c) How many posts are needed for a strip of land whose longer side measures 14 metres?

.....

(d) How many posts are needed for a strip of land whose longer side measures k metres (where k is an even number)?

.....

(e) A strip of land in this pattern needs a total of 58 posts.

Calculate its area.

.....

.....

QUESTION 77. (5 marks)

Heights (cm)

15	□ 6 7 9
16	2 3 4 5 5 7 8 9
17	0 4 7 7 7
18	2 4 7 8

The stem-and-leaf plot shows the heights of 21 students in a class.

(a) One entry (represented by □) is missing.

What is the missing entry if the range is 35 centimetres?

.....

(b) What is the median height of these students?

.....

(c) Explain why the mode is 177 centimetres.

.....

.....

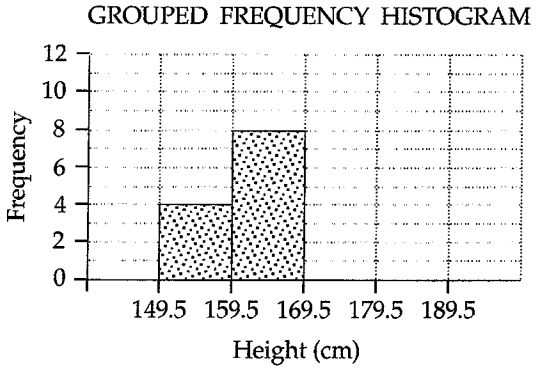
(d) A student is chosen at random from this class.

What is the probability that the student's height is greater than 180 centimetres?

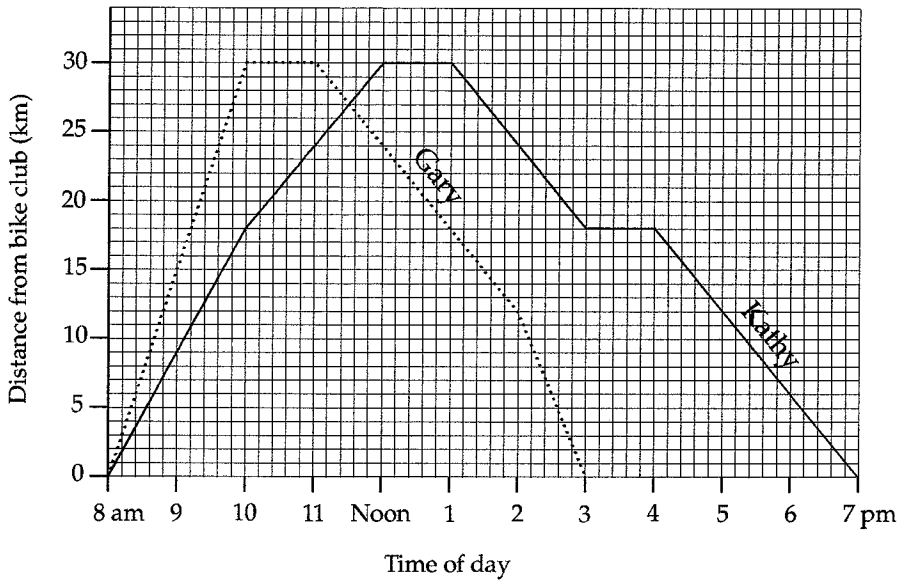
.....

(e) Gilda started to draw a grouped frequency histogram to represent the information in the stem-and-leaf plot.

Complete her histogram.



QUESTION 78. (5 marks)



The travel graph represents cycling trips of Kathy and Gary.
They rode from their bike club to a waterfall and back.

(a) Calculate Kathy's average speed for the first 2 hours.

.....

.....

(b) Describe Kathy's journey back from the waterfall.

.....

.....

(c) How far from the waterfall do Kathy and Gary meet?

.....

.....

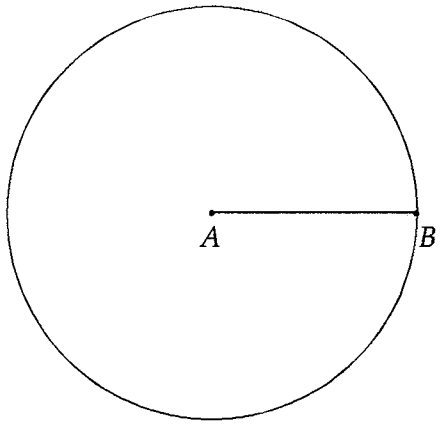
(d) A time period when Kathy and Gary are travelling at the same speed is

from ..... to .....

(e) Shane is a champion cyclist. He leaves the bike club at 2 pm on a training run to the waterfall and back. He completes the journey in 2 hours, without stopping.

Show the graph of Shane's trip on the above diagram.

QUESTION 79. (5 marks)



The diagram shows a circle with centre A and radius AB.

(a) Construct an angle BAC of 130° where C lies on the circle.

(b) Mark D on the circle so that CD is a diameter.

(c) Triangle ABD is isosceles.

State which sides are equal and give a reason for your answer.

.....

.....

(d) Find the size of angle ABD.

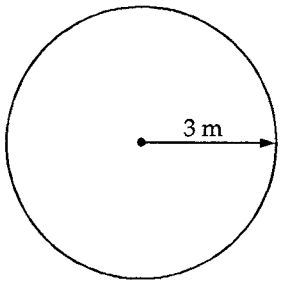
.....

.....

(e) On the above diagram, draw the circle with centre B so that CD is a tangent to this circle.

QUESTION 80. (5 marks)

(a)



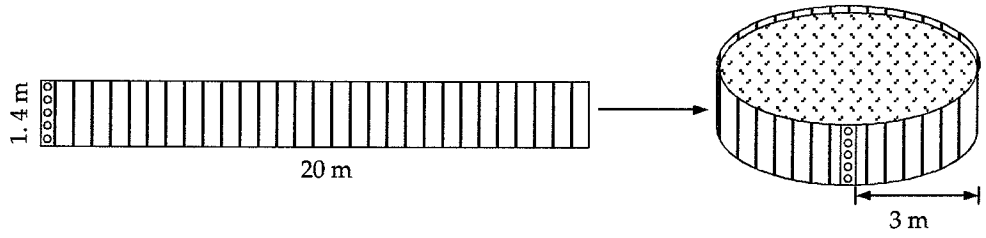
The base of a swimming pool is a circle of radius 3 metres.

Find its area correct to two decimal places.

.....

.....

The flexible metal sheet drawn below is used to form the wall of the pool.



(b) Find the volume of the pool, correct to the nearest cubic metre.

.....

.....

(c) Before a party, the pool is filled with water.
After the party, the depth has dropped to 98 centimetres.

What percentage of the water is left in the pool?

.....

.....

(d) When the circular wall was formed there was an overlap of the metal sheet. Calculate the length of overlap, correct to the nearest centimetre.

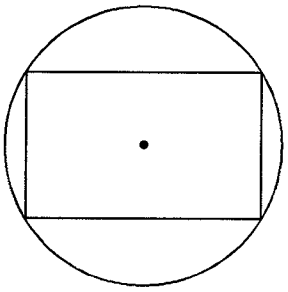
.....

.....

QUESTION 80. (Continued)

(e) A rectangular frame is placed so that each corner touches the circumference of the pool.

Give a possible pair of values for the length and breadth of the frame.



.....

.....

.....

End of test

BLANK PAGE