WELSH JOINT EDUCATION COMMITTEE

General Certificate of Secondary Education

WJEC CBAC

CYD-BWYLLGOR ADDYSG CYMRU

Tystysgrif Gyffredinol Addysg Uwchradd

184/06

MATHEMATICS

INTERMEDIATE TIER PAPER 2

A.M. TUESDAY, 11 June 2002

(2 Hours)

Centre Number .....

Candidate's Name (in full) .....

.....

Candidate's Examination Number .....

INSTRUCTIONS TO CANDIDATES

Write your centre number, name and candidate number in the spaces provided above.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

A calculator will be required for this paper.

A formula booklet is available and may be used.

You should give details of your method of solution, especially when a calculator is used.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	6	
2	2	
3	4	
4	2	
5	5	
6	6	
7	6	
8	3	
9	4	
10	4	
11	4	
12	4	
13	6	
14	3	
15	4	
16	6	
17	3	
18	3	
19	3	
20	6	
21	3	
22	6	
23	7	
TOTAL		

1. *(a)* Calculate 26% of £34.

.....

.....

.....

[2]

(b) The total cost of 8 loaves and 12 baguettes is £15.48.
One loaf costs 93p. Find the cost of one baguette.

.....

.....

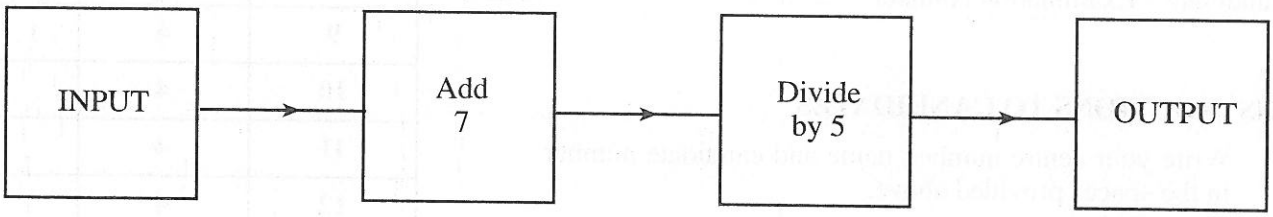
.....

.....

.....

[4]

2. The diagram below represents a number machine.



If the input is x, write down the output in terms of x.

.....

.....

[2]

3. *(a)* Simplify $7a - 5 - 3a - 4$.

.....

.....

[2]

(b) Find the value of $4x + 3y$ when $x = -6$ and $y = 5$.

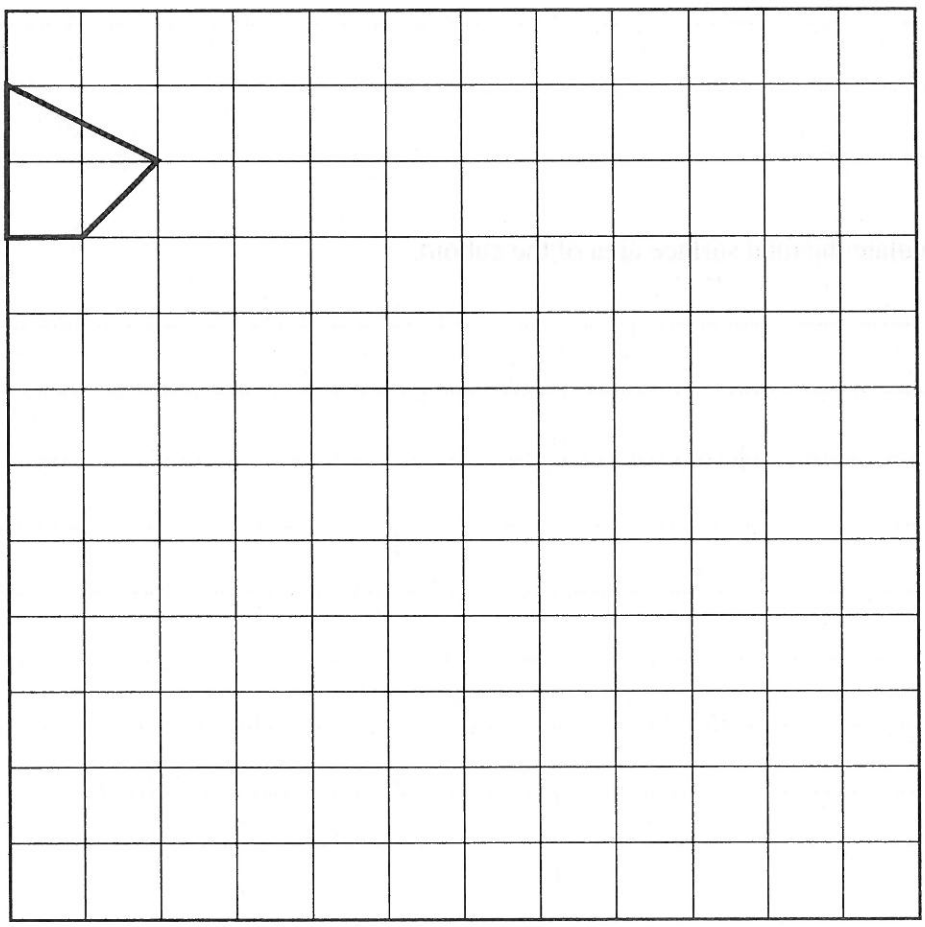
.....

.....

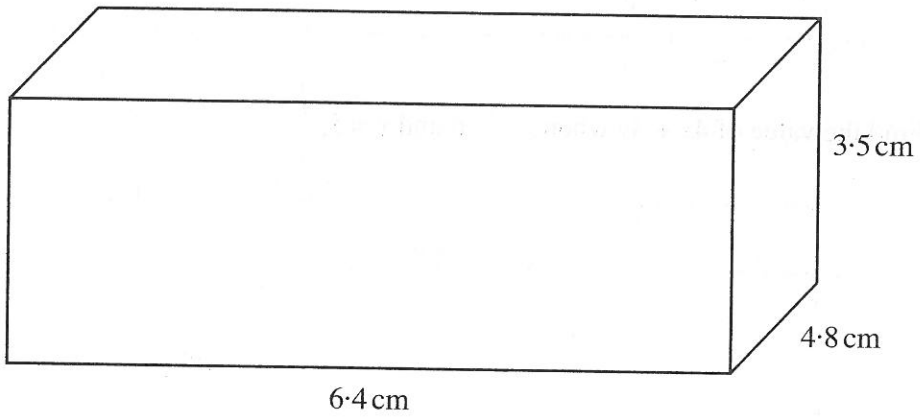
[2]

4. Draw, on the grid below, an enlargement of the given shape, using a scale factor of 4.

[2]



5. *(a)* A solid cuboid measures 6·4 cm by 4·8 cm by 3·5 cm, as shown in the diagram. Calculate its volume, clearly stating the units of your answer.



.....

.....

.....

[3]

(b) Calculate the total surface area of the cuboid.

.....

.....

.....

.....

.....

.....

.....

.....

[2]

6. Eighty pupils were asked what they drank with their breakfast. Of these pupils, 36 drank tea, 18 drank coffee, 16 drank milk and 10 drank other drinks.

(a) What is the probability that a randomly chosen pupil

(i) drank coffee at breakfast,

.....

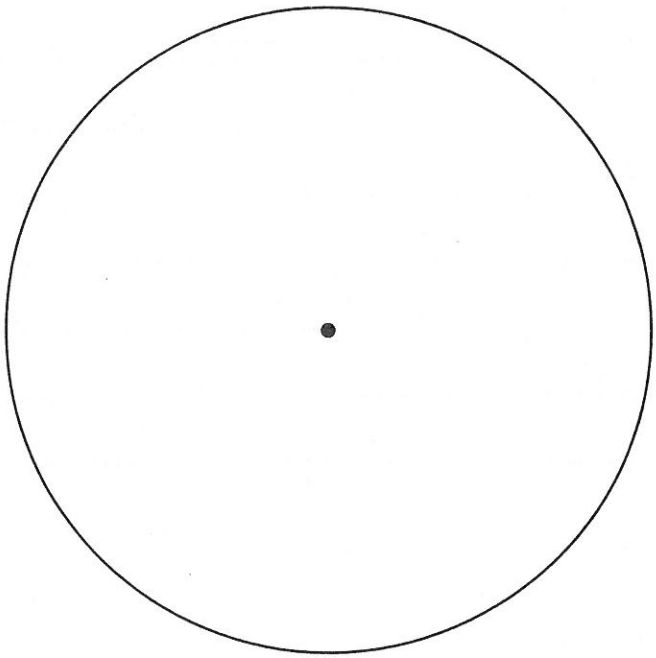
[1]

(ii) did not drink tea at breakfast?

.....

[1]

(b) Draw a pie chart to illustrate the different drinks that the pupils had with their breakfast. You should show how you calculate the angles of your pie chart.



.....

.....

.....

.....

.....

.....

.....

.....

[4]

7. Mr. and Mrs. Gann received their electricity bill. The details were as follows:

Present meter reading	54261
Previous meter reading	52815
Charge per unit	6.52 pence per unit
Service Charge	£10.56
VAT	5%

Showing all your working, find the total cost of the electricity including VAT.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[6]

8. *ABCD* and *ADEF* are two parallelograms in which $A\hat{D}C = 130°$ and $D\hat{E}F = 60°$. Find $B\hat{A}F$.

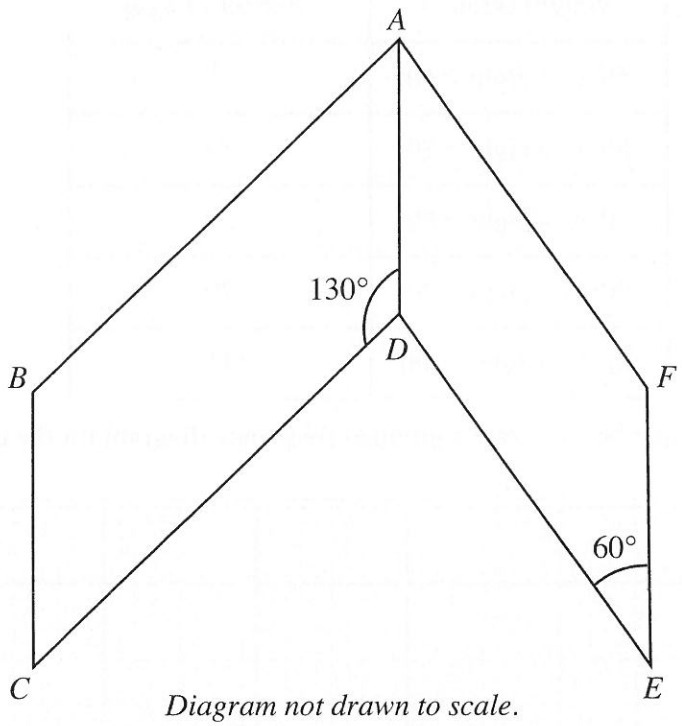


Diagram not drawn to scale.

.....

.....

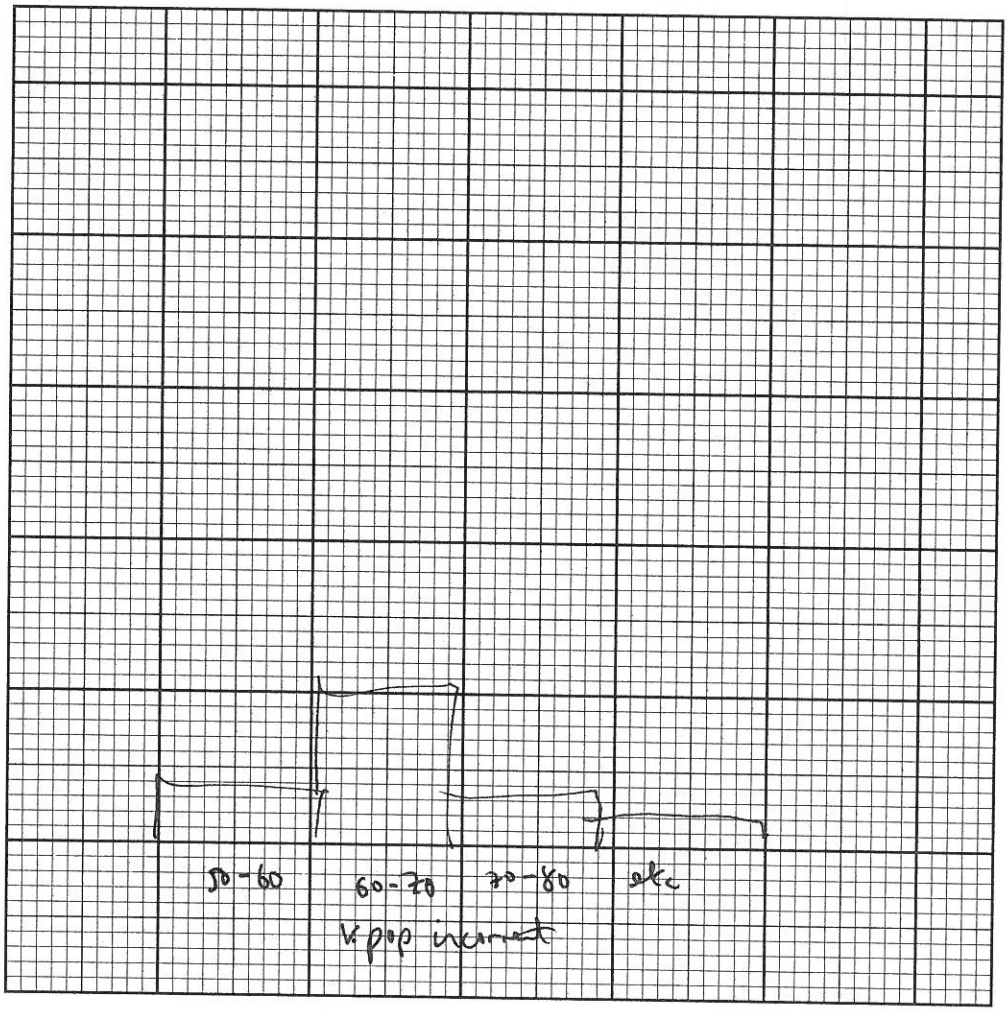
.....

[3]

9. The weights of eighty eggs were measured and the results are summarised in the following table.

Weight (grams)	Number of eggs
$50 \leqslant$ weight < 60	7
$60 \leqslant$ weight < 70	13
$70 \leqslant$ weight < 80	29
$80 \leqslant$ weight < 90	20
$90 \leqslant$ weight < 100	11

(a) On the graph paper below, draw a grouped frequency diagram for the data. [3]



(b) Write down the modal class.

.....

[1]

10. Write down, in terms of n, the nth term of **each** of the following sequences.

(a) 1×3 2×4 3×5 4×6 ..... × .....

.....

.....

[2]

(b) 3 10 17 24 .....

much improved

.....

.....

[2]

11. A gardener is making a circular lawn of radius 6 m.

(a) Calculate the area of the lawn.

.....

.....

.....

.....

[2]

(b) The gardener wishes to put an edging around the circumference of the lawn. Calculate the length of edging needed.

.....

.....

.....

.....

[2]

Examiner only
Arholwr yn unig

12. Beverley leaves home at 11.00 a.m. to go for a drive in her car. She travels a certain distance then stops for three quarters of an hour before starting back for home at a speed of 40 m.p.h.

The graph shows the first part of Beverley's journey up to the point where she stops.

(a) Calculate the speed for the first part of her journey.

.....

.....

.....

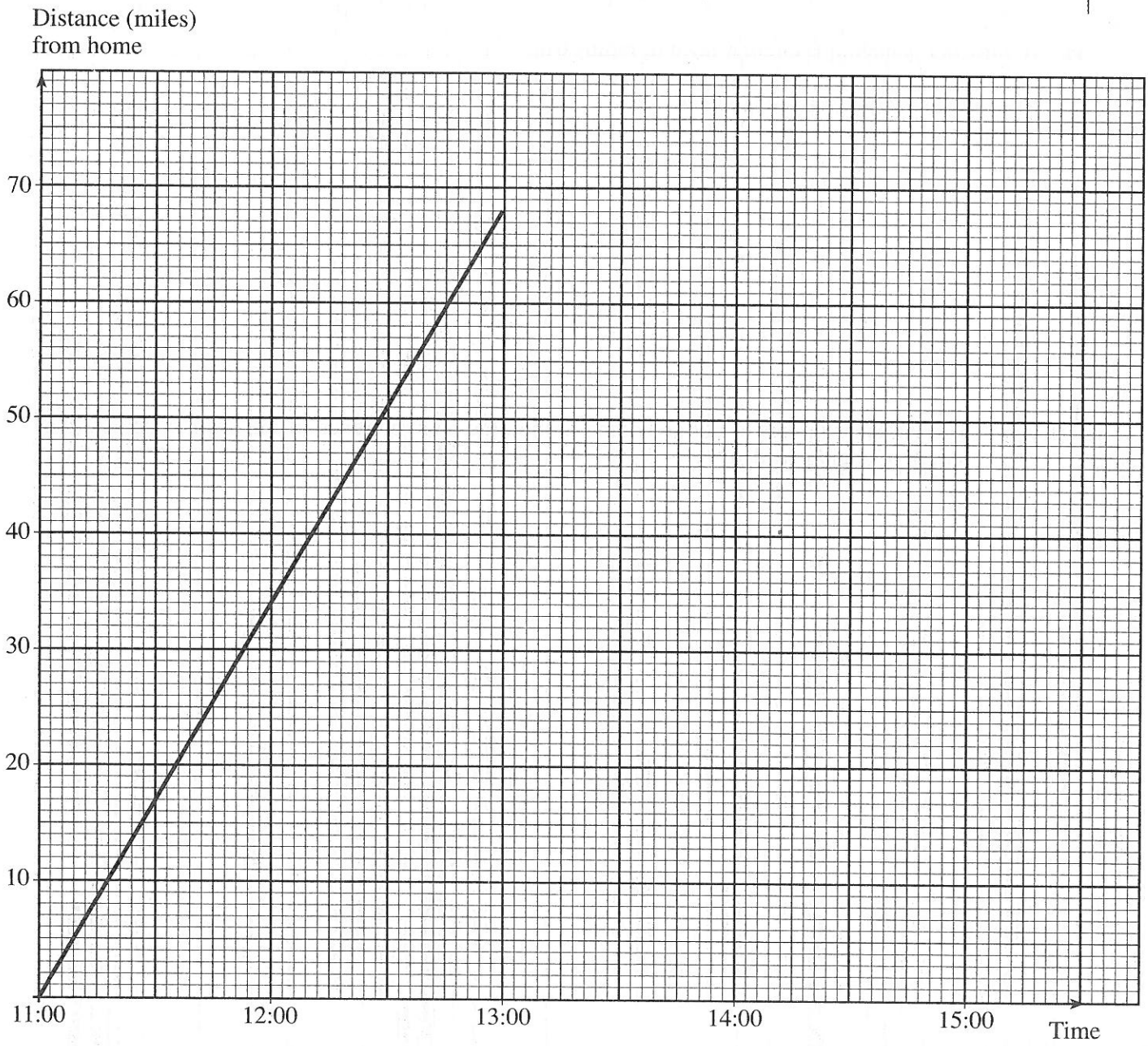
[2]

(b) On the graph paper, draw lines to represent

(i) her $\frac{3}{4}$ hour stop and

(ii) her return journey home. [2]

decimal to time is still a problem.



13. *(a)* The population of a country increased from 56 000 000 to 59 500 000. What percentage increase is this?

[3]

(b) What will be the amount if £5000 is invested for 3 years at the rate of 4% compound interest per annum?

1 mark available for S.I.

[3]

14. Solve the following equation.

$$\frac{15-4x}{7} = 3$$

[3]

15. A solution to the equation

$$x^3 + 5x - 30 = 0$$

lies between 2 and 3.

Use the method of trial and improvement to find this solution correct to one decimal place.

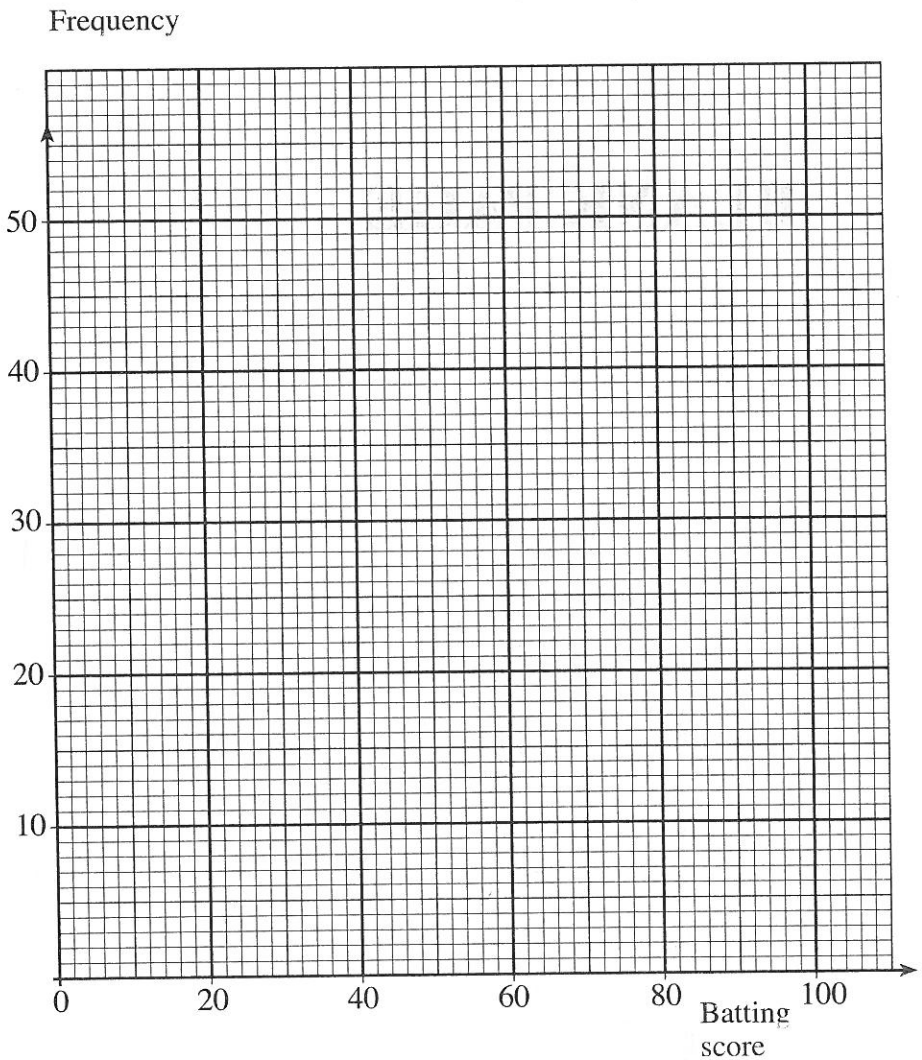
[4]

BLANK PAGE

16. *(a)* The batting scores of 100 cricketers were recorded and the results are summarised in the following table.

Batting score	Frequency
0 - 19	20
20 - 39	45
40 - 59	24
60 - 79	9
80 - 99	2

On the graph paper, below draw a frequency polygon for the data. [2]



(b) Find an estimate for the mean of the batting scores.

.....

.....

.....

.....

.....

.....

.....

[4]

17. The diameter of a circle, AB, is of length 8·7 cm, BC has length 5·4 cm and $\hat{ACB} = 90°$. Calculate the length of AC.

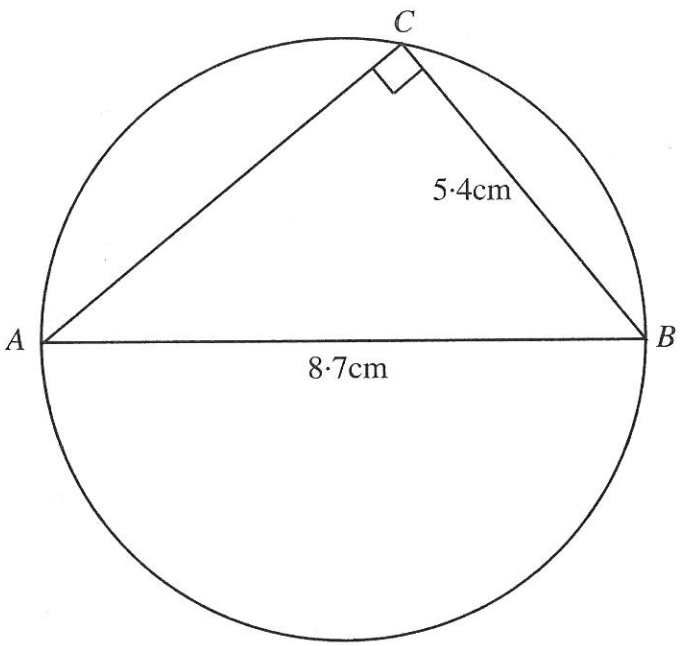


Diagram not drawn to scale.

.....

.....

.....

.....

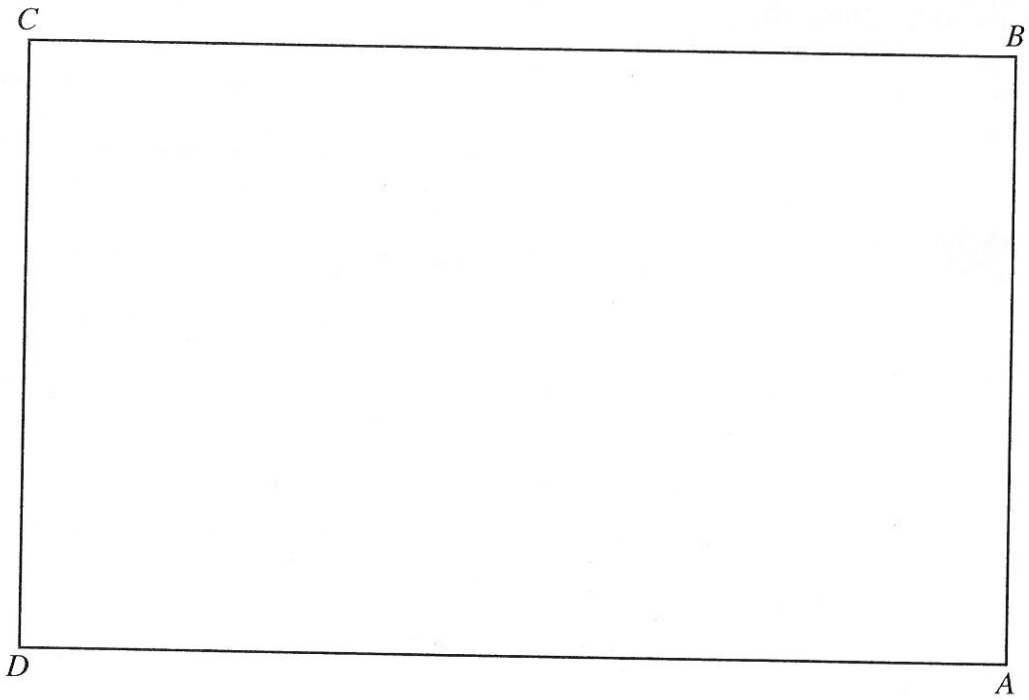
.....

.....

.....

[3]

18. *ABCD* is a rectangle.



(a) Draw the locus of all the points inside the rectangle whose distance from *AB* is the same as their distance from *AD*.

(b) Draw the locus of all the points inside the rectangle which are 6 cm from *DC*.

(c) Draw the locus of all the points inside the rectangle whose distance from *A* is the same as the length of *AB*.

[3]

19. Find, in standard form, the value of

(a) $(7{\cdot}4 \times 10^{-5}) \times (3{\cdot}9 \times 10^{-4})$,

.....

.....

[1]

(b) $\dfrac{59639}{0{\cdot}087}$.

.....

.....

[2]

20. *(a)* Simplify the expression

$$(4x^3y^2) \times (2x^4y^5).$$

.....

.....

[2]

(b) Expand and simplify

$$(x + 5)\,(x - 6).$$

.....

.....

[2]

(c) Make d the subject of the following formula.

$$h = \sqrt{t - d}$$

.....

.....

.....

.....

[2]

21. Solve the following equation.

$$\frac{4x-8}{3} - \frac{x}{6} = 2$$

.....

.....

.....

.....

.....

.....

.....

.....

[3]

22. A vertical flagpole, *BDC*, stands on horizontal ground *ABE*. It is supported by two ropes *AC* and *DE*. The length of *AC* is 13·5 m, and the distance *CD* is 4·7 m. The rope *AC* makes an angle of 62° with the ground and the rope *DE* is fixed to the ground at *E* such that *BE* is 8·4 m.

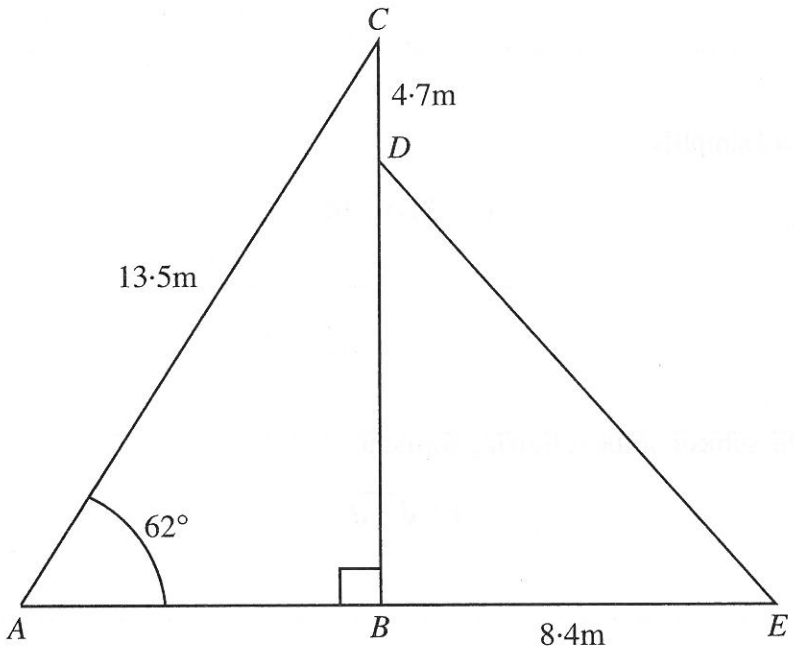


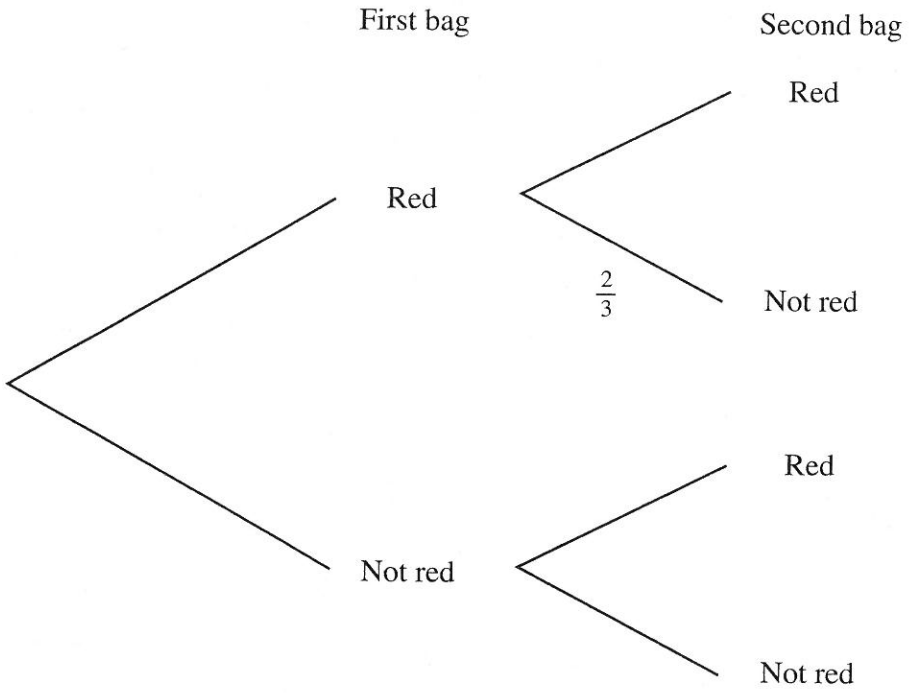
Diagram not drawn to scale.

Calculate the size of $\hat{BDE}$.

[6]

23. Two bags contain some coloured balls, which are identical except for their colour.
One ball is taken at random from each bag and their colours noted.
The probability of the selected ball from the first bag being red is $\frac{1}{4}$.
The probability of the selected ball from the second bag NOT being red is $\frac{2}{3}$.

(a) Complete the following tree diagram. [2]



(b) Calculate the probability that both balls are red.

.....

.....

[2]

(c) Calculate the probability that only one ball is red.

.....

.....

[3]