OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION **H** **B263B**

MATHEMATICS B (MEI)

PAPER 1 SECTION B

HIGHER TIER

Afternoon

MONDAY 4 JUNE 2007

Time: 45 minutes

Additional materials: Geometrical instruments
Scientific or graphical calculator
Tracing paper (optional)

CUP/T40908

Candidate Name

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show all your working. Marks may be given for working which shows that you know how to solve the problem, even if you get the answer wrong.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- Unless otherwise instructed in the question, take π to be 3.142 or use the π button on your calculator.
- The total number of marks for this Section is 36.
- Section B starts with question 11.

FOR EXAMINER'S USE	
Section B	

This document consists of **10** printed pages and **2** blank pages.

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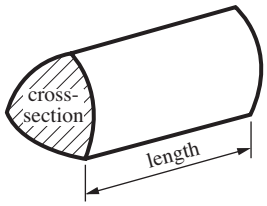
Formulae Sheet: Higher Tier

Volume of prism = (area of cross-section) × length

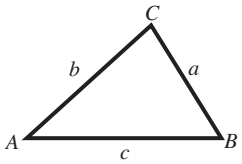


In any triangle *ABC*

Sine rule $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

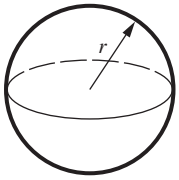
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle = $\frac{1}{2}ab\sin C$



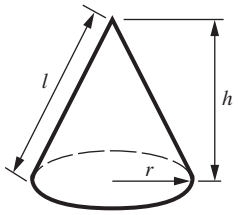
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

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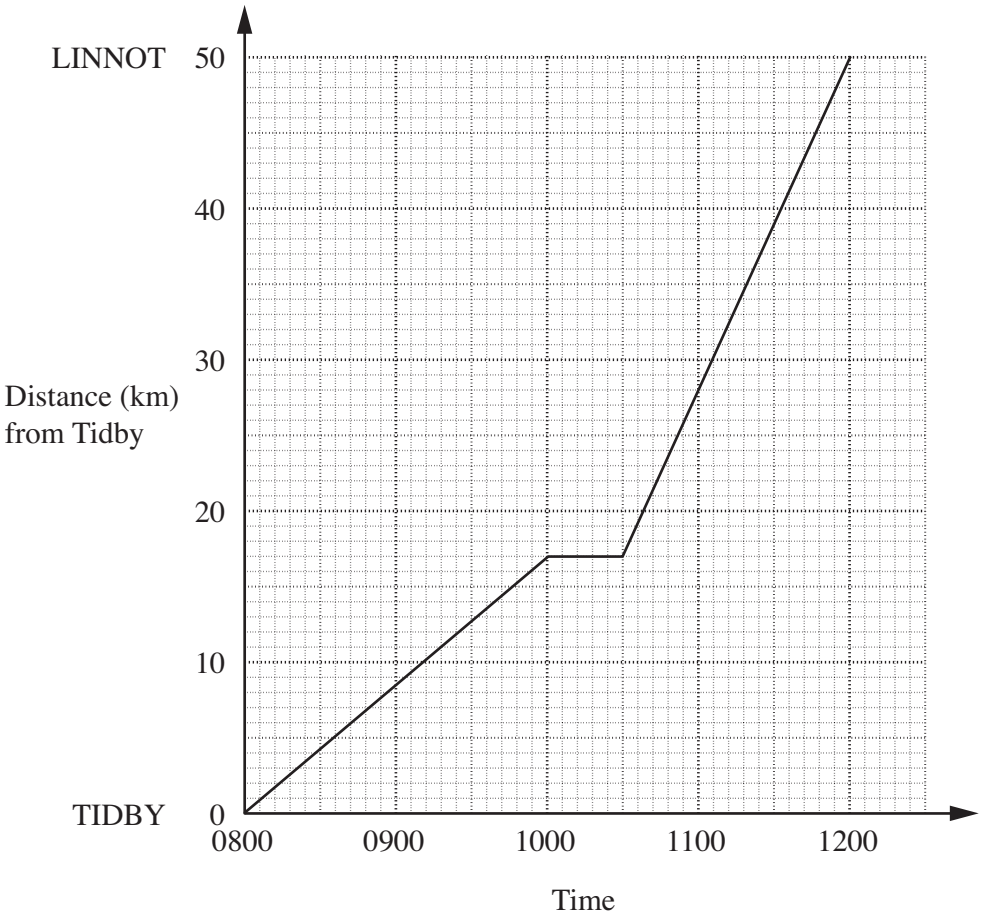
11



The graph shows Arthur's journey between the towns of Tidby and Linnot.

(a) How far did Arthur travel in the first two hours of his journey?

(a) .....km [1]

(b) For how many minutes did Arthur stop during his journey?

(b) ..... minutes [1]

(c) Calculate Arthur's speed for the last part of his journey.

(c) .....km/h [3]

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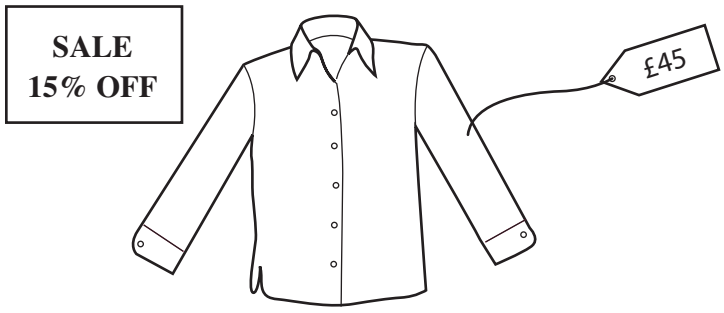
12



Filipa buys a blouse that usually costs £45.
How much should she pay for the blouse in the sale?

£ ..... [3]

13 **(a)** Solve this inequality.

$$5x - 10 > 2$$

(a) ..... [2]

(b) Make t the subject of this formula.

$$s = 4t + 12$$

(b) $t =$ ..... [2]

(c) Solve.

$$\frac{13 - x}{3} = 5$$

(c) ..... [3]

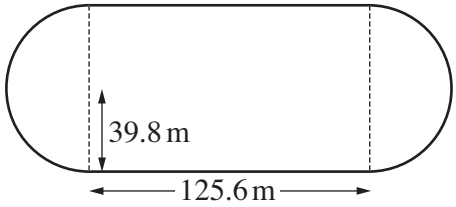
(d) Solve these simultaneous equations algebraically.

$$5x + 2y = 46$$
$$2x - 3y = 26$$

(d) $x =$ .....

$y =$ ..... [4]

14 A cycle track has two semi-circular ends of radius 39.8 m and two straights of length 125.6 m.



Not to scale

Calculate the total distance around the cycle track.

..... m [4]

15 The table below summarises the prices of 75 cars.

Price (£t)	Frequency
$5000 < t \leqslant 8000$	20
$8000 < t \leqslant 11000$	36
$11000 < t \leqslant 14000$	9
$14000 < t \leqslant 17000$	6
$17000 < t \leqslant 20000$	4

(a) Calculate an estimate of the mean price of these cars.

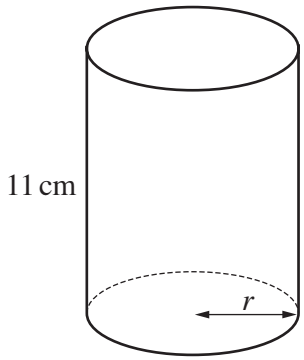
(a) £..... [4]

(b) One of these cars is selected at random.

What is the probability that the price of this car is more than £17000?

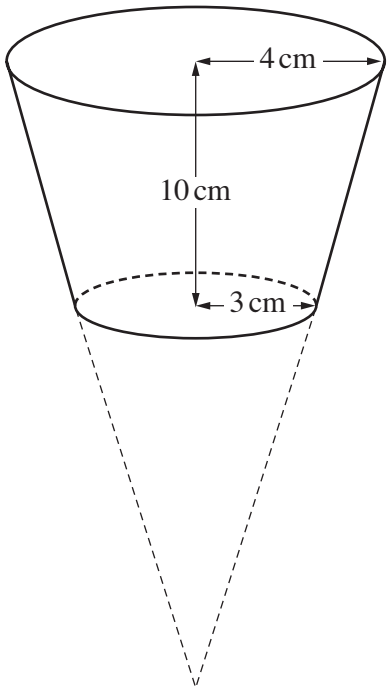
(b) ..... [1]

16 A cylindrical can has a volume of $475\,cm^3$.
The height of the can is 11 cm.
Calculate the radius, r, of the circular base of the can.



..... cm [4]

17 The diagram shows a plastic cup.
The cup is part of a cone, the rest of which is shown by broken lines.
The top and bottom of the cup are horizontal circles, with radii 4 cm and 3 cm.
The cup is 10 cm tall.



(a) Explain why the depth of the whole cone is 40 cm. [1]

(b) Calculate the capacity of the cup.

(b) .....cm^3 [3]

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