

FOR OFFICIAL USE

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Total
mark

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X056/101

NATIONAL
QUALIFICATIONS
2001

THURSDAY, 17 MAY
9.00 AM - 9.35 AM

**MATHEMATICS
INTERMEDIATE 1**
Units 1, 2 and 3
Paper 1
(Non-calculator)

Fill in these boxes and read what is printed below.

Full name of centre

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Town

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Forename(s)

--

Surname

--

Date of birth

Day Month Year

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Scottish candidate number

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Number of seat

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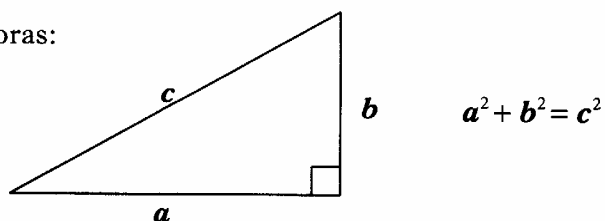
- 1 You may NOT use a calculator.**
- 2 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.**
- 3 Full credit will be given only where the solution contains appropriate working.**
- 4 Before leaving the examination room you must give this book to the invigilator. If you do not you may lose all the marks for this paper.**

FORMULAE LIST

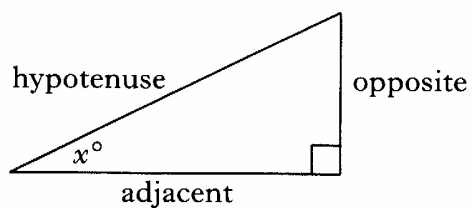
Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



Trigonometric ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

ALL questions should be attempted.

Marks

1. (a) Find 7.35×8 .

1

- (b) Find $\frac{3}{4}$ of £82.

1

2. Part of the timetable of the overnight bus from Stirling to London is shown opposite.

Stirling (depart)	2140
London (arrive)	0615

How long does the journey from Stirling to London take?

1

3. Eight jars of jam can be made from 2 kilograms of raspberries.
How many jars of jam can be made from 5 kilograms of raspberries?

2

[Turn over

Marks

4. Jenna is buying a car. The cash price is £11500. It can be bought on hire purchase by paying a deposit of 20% of the cash price and 36 instalments of £300.



Find the total hire purchase price of the car.

5. Solve algebraically the equation

$$7b - 6 = 3b + 38.$$

3

3

Marks

6. During a period of 30 days the temperature at a weather station is recorded each day.

The frequency table below shows these temperatures.

<i>Temperature</i> ($^{\circ}\text{C}$)	<i>Frequency</i>	<i>Temperature</i> \times <i>Frequency</i>
-3	1	
-2	2	
-1	4	
0	2	
+1	6	
+2	8	
+3	3	
+4	4	

- (a) Write down the modal temperature.

1

- (b) Complete the table above and find the mean temperature.
Give your answer as a decimal.

3

[Turn over

Marks

7. (a) Multiply out the brackets and simplify

$$8w + 3(2 - w).$$

2

(b) Factorise $45 + 5a.$

2

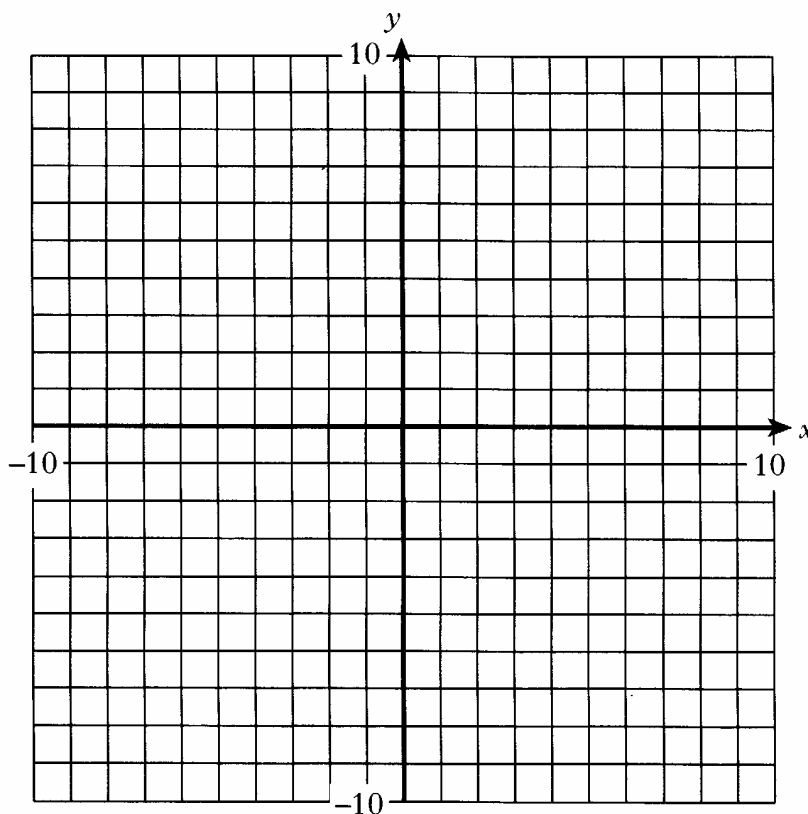
8. (a) Complete the table below for $y = 2x - 5$.

x	-1	0	4
y			

Marks

2

(b) Using the table in part (a), draw the graph of $y = 2x - 5$ on the grid.



2

[Turn over

Marks

9. The manager of the Central Hotel is buying new televisions for each of the hotel's 50 bedrooms. Two suppliers offer him the following deals.

ELECTRO

Televisions
£199.99 each

KOSTCUTS

Televisions
£210 each

* Get one free for
every ten you buy

Which supplier offers the lower price for 50 televisions?

You must show your working.

4

10. Use the formula below to find the value of D when $b = 3$ and $k = 7$.

$$D = \sqrt{b^2 + k}$$

Marks

3

11. (a) Find $7 - (-2)$.

1

- (b) Find $-24 \div (-3)$.

1

[END OF QUESTION PAPER]

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Total
mark

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X056/103

NATIONAL
QUALIFICATIONS
2001

THURSDAY, 17 MAY
9.55 AM – 10.50 AM

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and 3
Paper 2

Fill in these boxes and read what is printed below.

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Day Month Year

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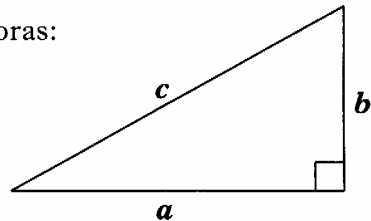
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FORMULAE LIST

Circumference of a circle: $C = \pi d$

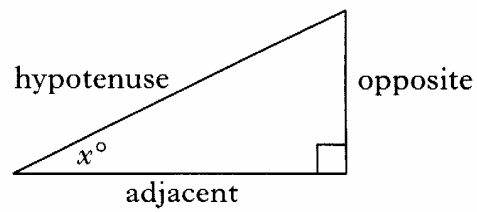
Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Trigonometric ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

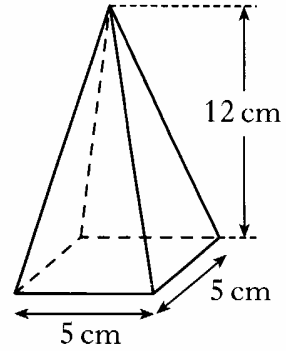
Marks

ALL questions should be attempted.

1.

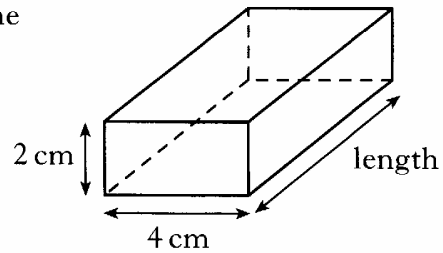
$$\text{Volume of pyramid} = \frac{1}{3} \text{ of (area of base} \times \text{height)}$$

- (a) Use the formula above to work out the volume of this square-based pyramid.



3

- (b) This cuboid has the same volume as the pyramid shown above.
Find the length of the cuboid.

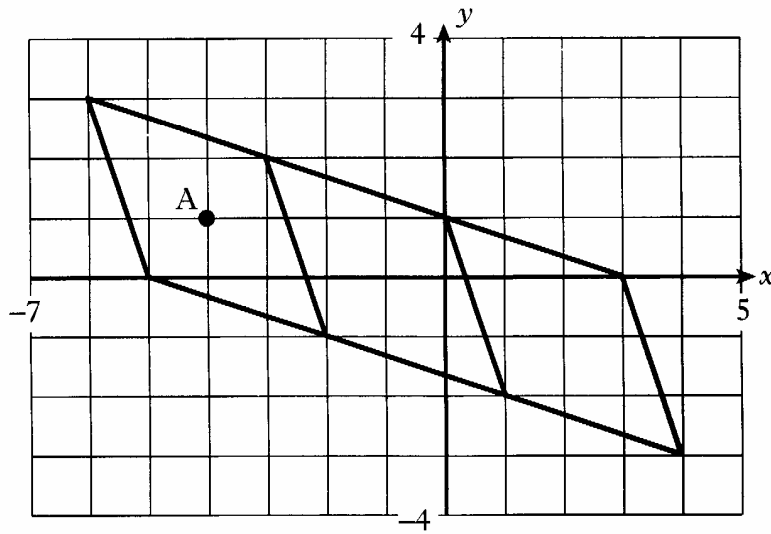


2

[Turn over

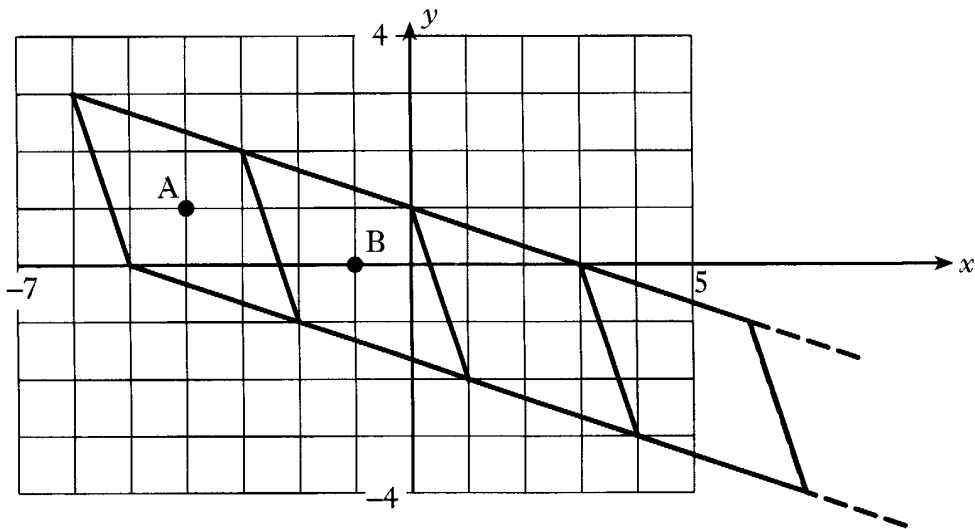
Marks

2. (a) Write down the coordinates of the point A marked on this diagram.



1

(b) The pattern of parallelograms continues.



A is the centre of the first parallelogram.

B is the centre of the second parallelogram.

Find the coordinates of the centre of the sixth parallelogram.

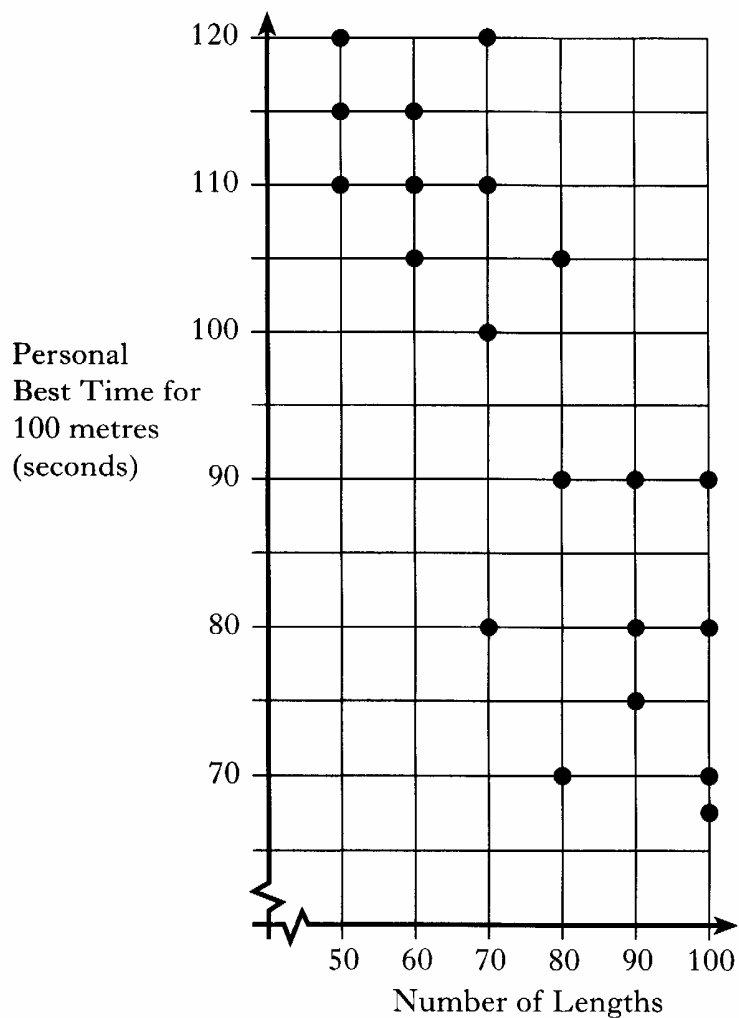
2

Marks

3. A group of swimmers record

- the number of lengths they swim in each training session
- their personal best time (in seconds) for swimming 100 metres in competition.

The scattergraph shows the results.



(a) Draw a line of best fit through the points on the graph.

1

(b) Use the graph to estimate the personal best time of a swimmer who swims 75 lengths in each training session.

1

[Turn over

Marks

4. Solve algebraically the inequality

$$2x + 3 > 10.$$

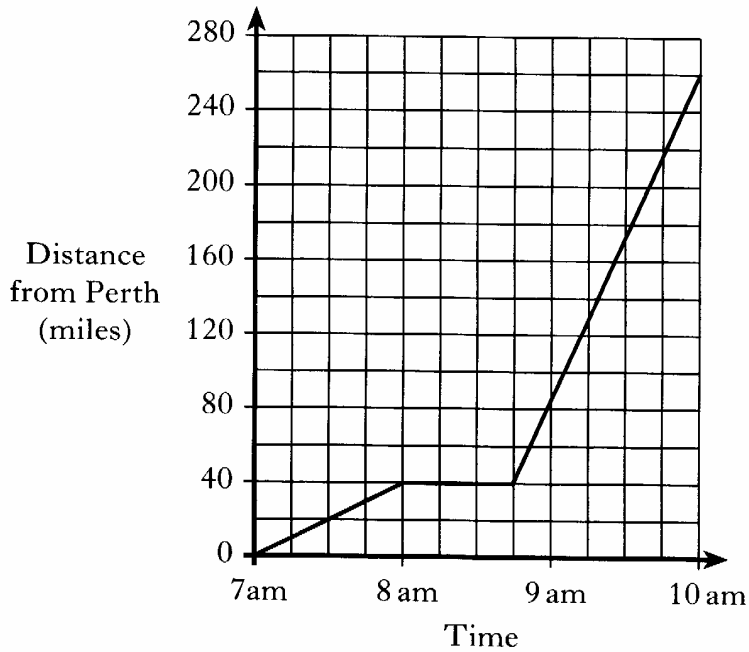
2

5. A compact disc can store 1.44×10^6 bytes of information.
How many bytes of information can 25 of these discs store?
Write your answer in standard form.

3

6. Andrea leaves home in Perth at 7 am and drives 40 miles to Edinburgh Airport where she then catches a flight to Dublin. Her journey is shown on the graph below.

Marks



- (a) How long does she spend waiting at Edinburgh Airport?

1

- (b) Calculate the average speed of her flight from Edinburgh to Dublin.

4

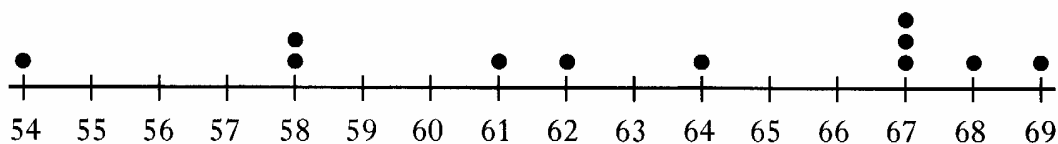
[Turn over

Marks

7. Walter is a double glazing salesman.
Each month he earns £500 **plus** 5% commission on all his sales.
Calculate the value of his sales in a month when his **total earnings** were £1900.

3

8. The weights (to the nearest kilogram) of the 11 players in a hockey team are shown on the scale below.



- (a) What percentage of the team weighs less than 60 kg?
Give your answer correct to 1 decimal place.

4

- (b) Write down the median weight of the team.

1

- (c) If another player is added to the scale the new median is 65 kg. What is the weight of this player?
Explain your answer.

2

Marks

9. The box office takings at cinemas in the UK and the USA from showing "The Spartans" are shown below.

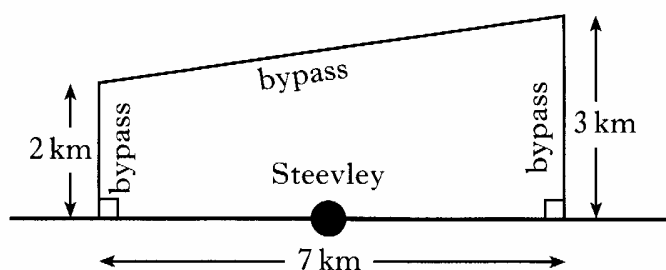
"THE SPARTANS"	
Box Office Takings	
UK	£10 230 000
USA	\$15 800 000

Exchange Rate: £1 = \$1.52

Change the box office takings in the USA to pounds sterling.
Give your answer to the nearest thousand pounds.

3

10. A bypass is being built to reduce the traffic passing through Steevley as shown in the diagram.



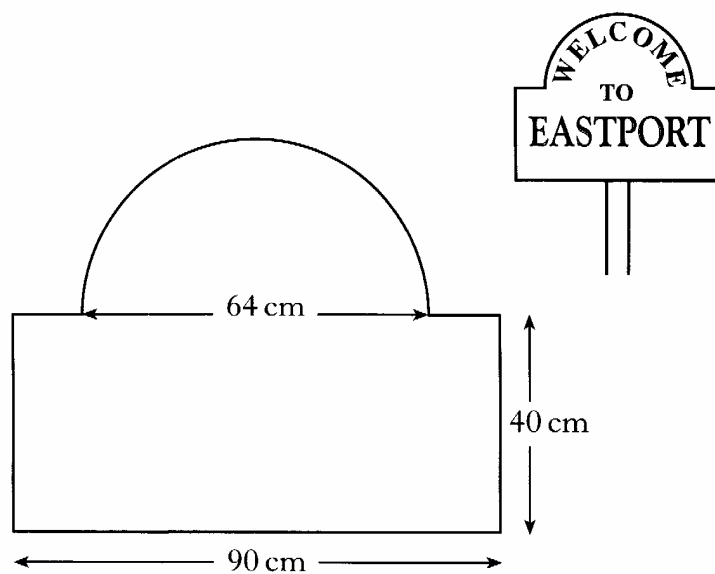
Calculate the total length of the bypass.

Do not use a scale drawing.

4

Marks

11. This sign is in the shape of a rectangle and a semi-circle.



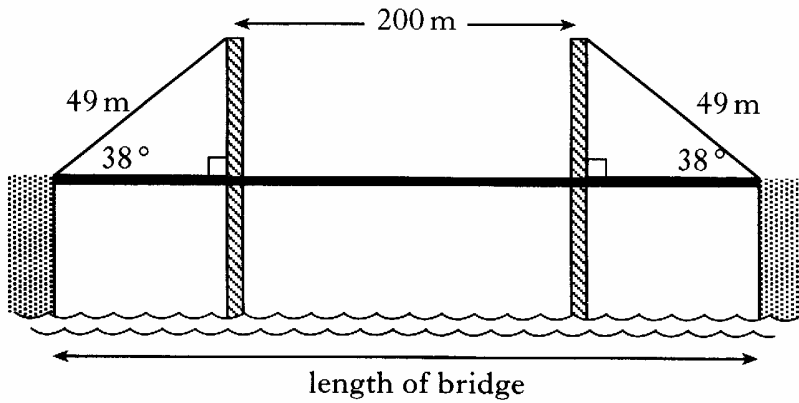
Calculate the area of the sign.

Give your answer to the nearest square centimetre.

5

Marks

12. The towers of a bridge are 200 metres apart.
Steel cables of length 49 metres are used to support the bridge at both ends.
The cables make an angle of 38° with the bridge.



Find the total length of the bridge.

4

[END OF QUESTION PAPER]