

Surname	Centre Number	Candidate Number
Other Names		0



GCSE

4351/02

**MATHEMATICS (UNITISED SCHEME)
UNIT 1: MATHEMATICS IN EVERYDAY LIFE
HIGHER TIER**

A.M. WEDNESDAY, 11 January 2012

1 $\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

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

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3.14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

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.

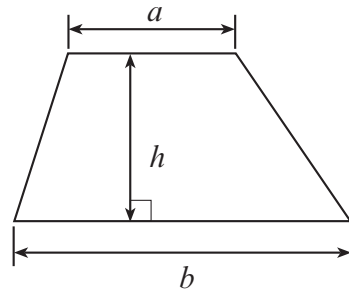
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 7.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	4	
2	5	
3	3	
4	3	
5	4	
6	4	
7	7	
8	3	
9	3	
10	4	
11	4	
12	4	
13	6	
14	5	
15	6	
TOTAL MARK		

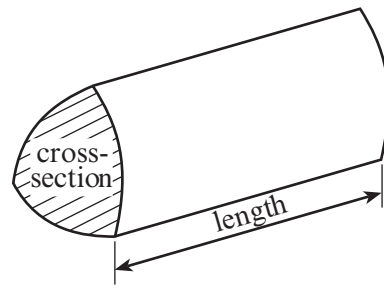


Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$

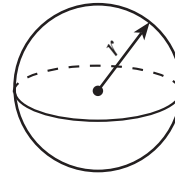


Volume of prism = area of cross-section \times length



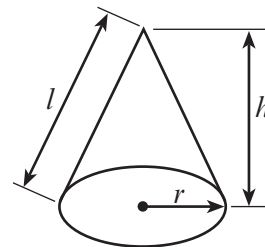
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = $\pi r l$

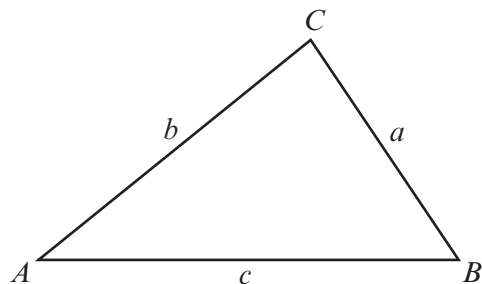


In any triangle ABC

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

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

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



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$ are given by

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



- 1. An agricultural college tested the fruit yield from two different varieties of trees. They conducted the test for 3 years.

Tree A produced 225 kg of fruit in its first year but the weight was reduced by $\frac{1}{3}$ of the previous yield for each of the next two years.

Tree B produced 200 kg of fruit in its first year but the weight was reduced by 20% of the previous yield for each of the next two years.

Showing all of your calculations, find which tree produced the most fruit in the third year, and by how many kilograms.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

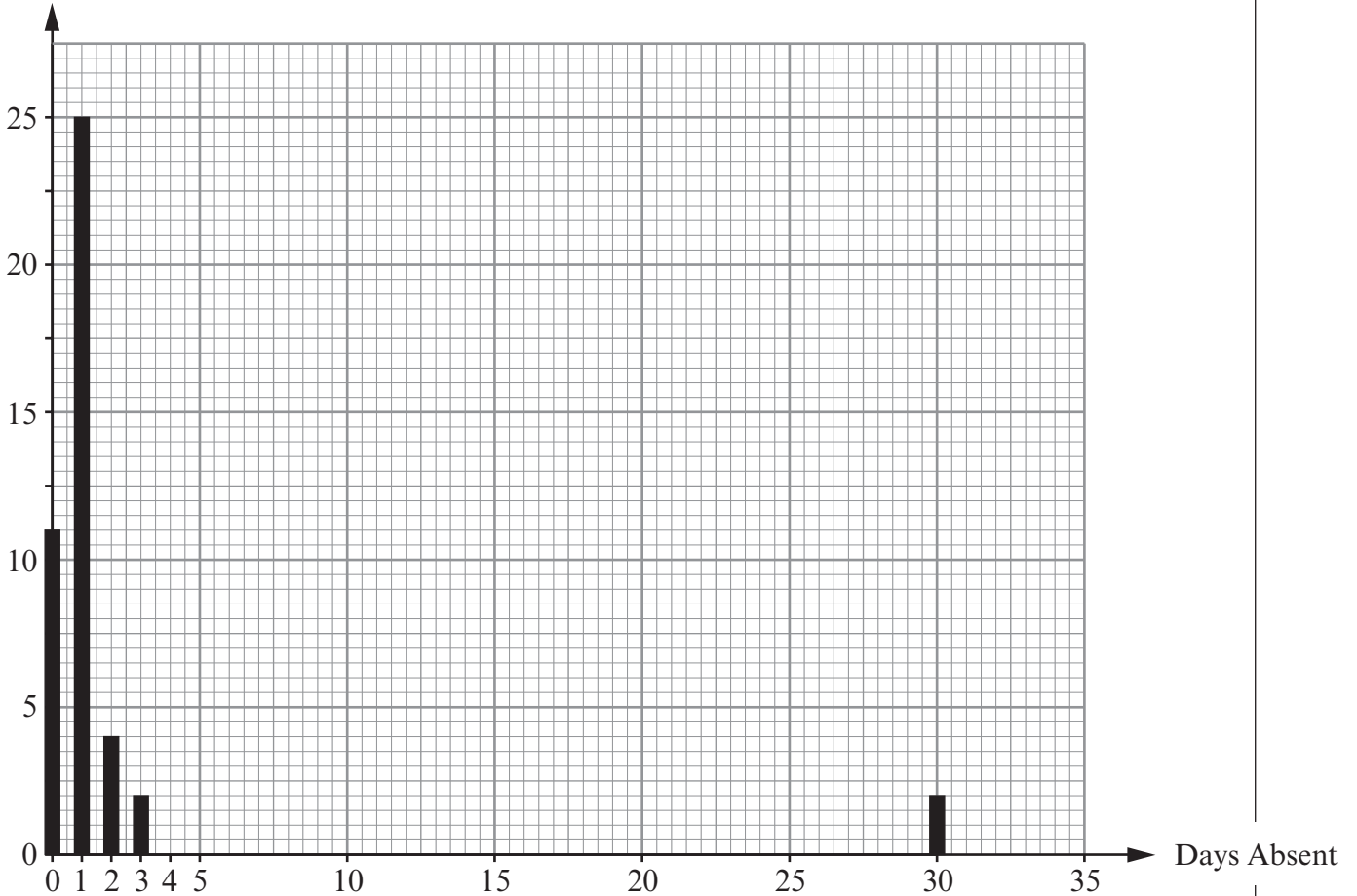
[4]

4351
020003



2. (a) A factory employs 44 people. The diagram below shows the distribution of the number of days' absence for each of these workers during the last three months.

Number of Workers



- (i) Calculate the mean number of days' absence of the workers.

.....

.....

.....

.....

[3]

- (ii) Why do you think this mean is a poor indicator for the average number of days' absence for these workers?

.....

.....

[1]



- (b) Why would it not be helpful, when calculating the mean, to show the information as a table with equal group intervals of 5 days starting with 0 to 4 days?

.....

.....

.....

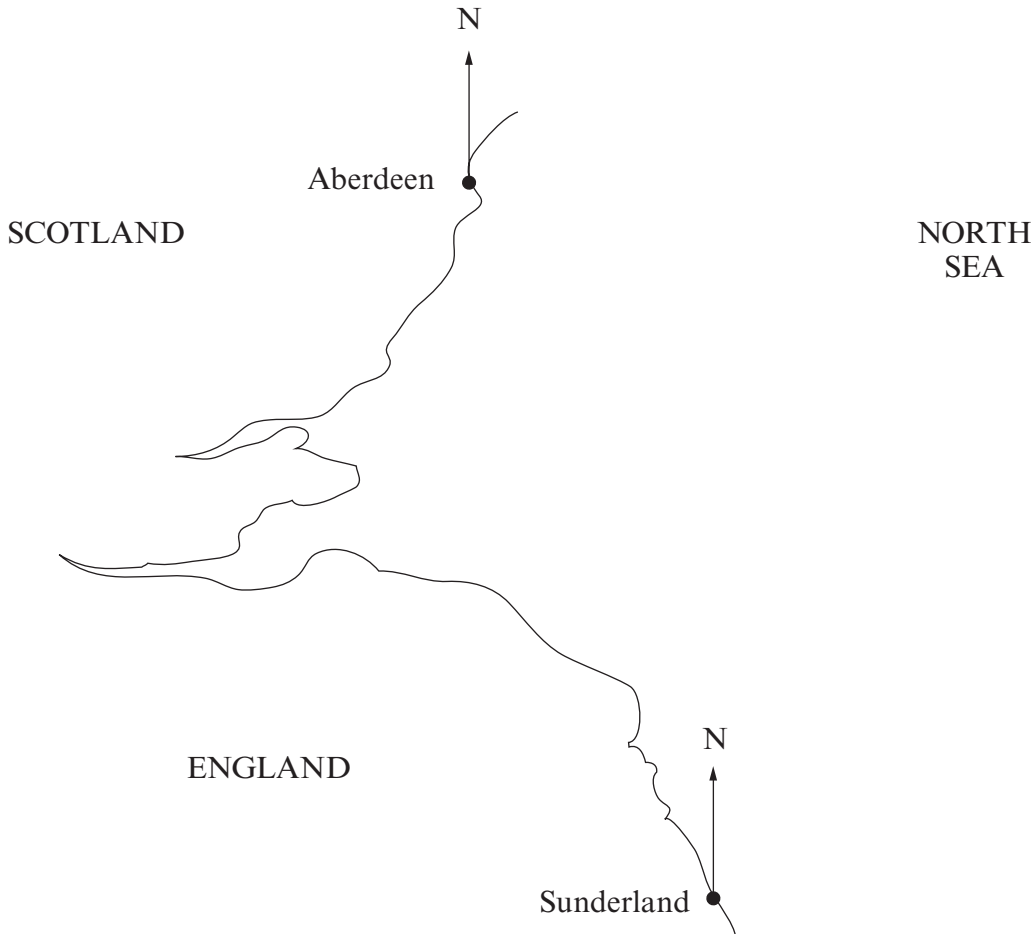
[1]



- 3. An oil ship is sailing in the North Sea.
It is 150 km from Sunderland on a bearing of 065°.

Plot its position on the diagram below and give its bearing from Aberdeen.

Scale : 1 cm represents 25 km



The bearing of the ship from Aberdeen is

[3]



- 4. Sian is driving along a road in Germany, which has a speed limit of 80 km per hour. She is driving at 55 mph.

By how much is her speed above or below the speed limit?

.....

.....

.....

.....

.....

.....

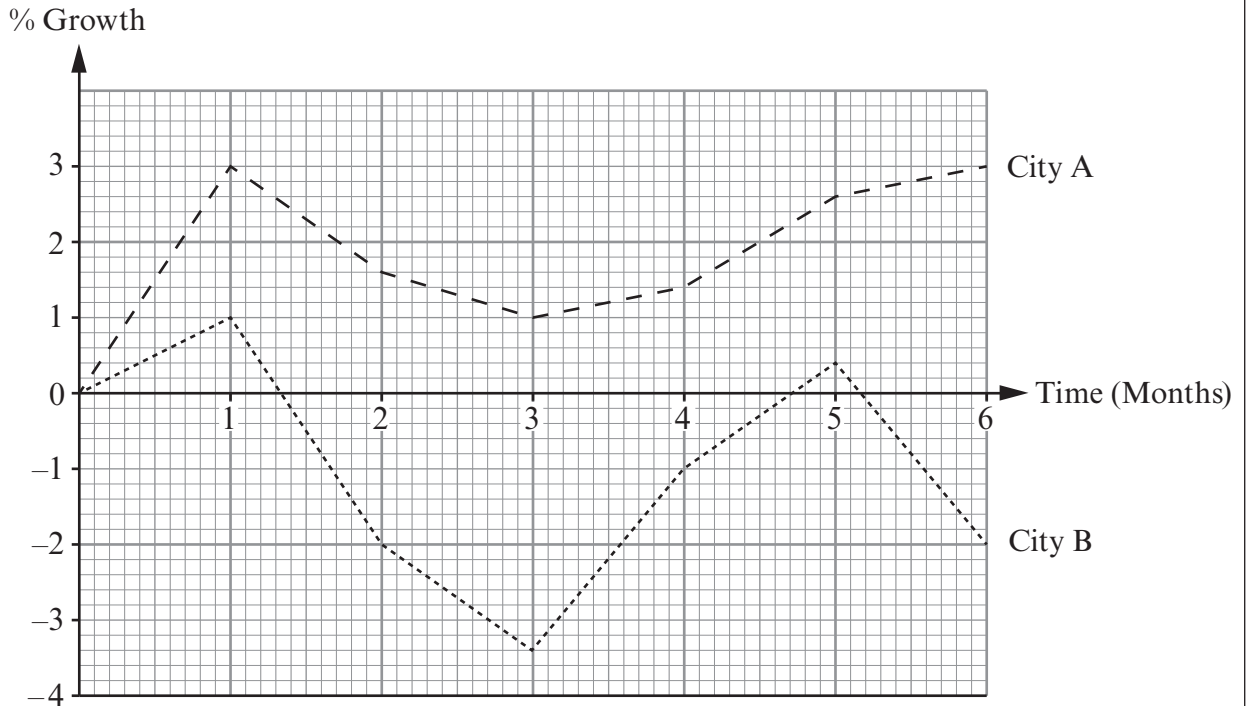
[3]

4351
02/00/07



5. (a) A newspaper displayed a graphical representation to compare the percentage growth in reported crimes in two cities (A and B) over a period of six months.

REPORTED CRIME: % Growth in City A and City B



- (i) What is the difference in the percentage growth in reported crime between the two cities at the end of the six months?

..... [1]

- (ii) Can we say from the graph that there is more reported crime in city A than in city B? You must give an explanation for your answer.

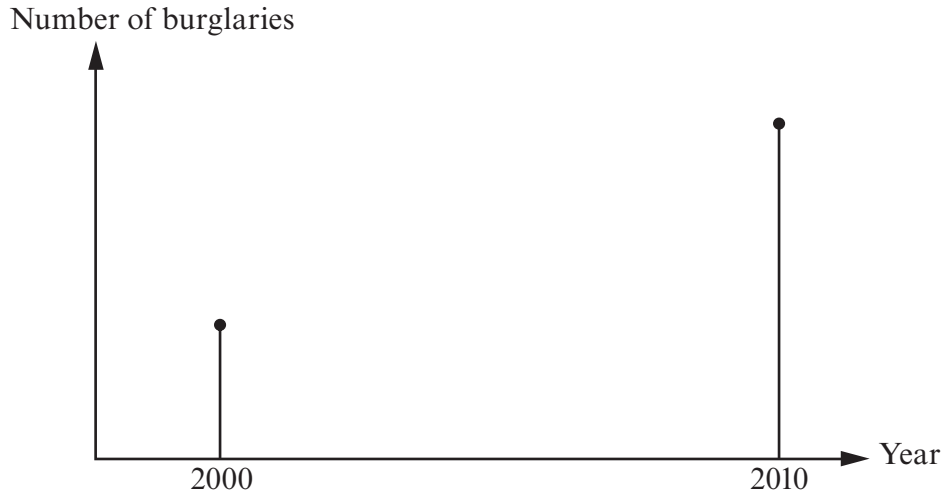
.....

 [1]



(b) A newspaper printed the diagram shown below with the headline

'Huge and steady increase in burglary over the last ten years'



Give **two** reasons why the diagram and headline might be misleading.

- (i)
-
- (ii)
-

[2]



6. Helen and James are travelling by plane from London to Los Angeles.

They see the following information when they arrive at the airport on Tuesday.

Current Day and Time	
LONDON	LOS ANGELES
Tuesday 15:40	Tuesday 07:40

Their flight leaves in two and a half hours' time.

The flight time between London and Los Angeles is 11 hours and 20 minutes.

Give the time and the day in Los Angeles when they land.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]



8. The following two scales are given on a scale drawing of a house.



Use **the above scales** to convert 1 metre into yards. Give your answer correct to one decimal place.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[3]



9. A shop has reduced the price of a bicycle by 40% of its original price.

The sale price of the bicycle is £192.

Calculate the original price of the bicycle.

.....

.....

.....

.....

.....

.....

[3]



10. An electricity company uses the following formula to calculate how much to charge its customers.

$$\text{Charge} = (\text{FR} - \text{IR}) \times 11.29\text{p} + \text{D} \times 13.35\text{p} - \frac{1}{4} \text{AB}$$

A customer was charged £174.16.

Calculate, to the nearest penny, the **Annual Bonus (AB)** for this customer when the

- **Initial meter reading (IR)** was 45238
- **Final meter reading (FR)** was 46740
- **Days at standard charge (D)** was 91

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]



11. A company had intended to send representatives to business conferences in the Far East. An amount of pounds (£) was exchanged for Hong Kong dollars (HK\$) for one employee. An equal amount of pounds was exchanged for Japanese yen (yen) for another employee.

Both conferences were cancelled and the money had to be exchanged back into £s. Data on the exchange values at that time is shown below.

	Hong Kong Dollars (HK\$)	Japanese yen (yen)
Conversion from pounds	£1 = 11.60\$	£1 = 127.2 yen
Conversion back to pounds	£1 = 12.20\$	£1 = 135.9 yen

Calculate on which of the two currency exchanges the company lost most money.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]



12. It takes 4 hours to empty 6 identical tanks of oil using 15 identical pumps.

How long would it take to empty 2 of these tanks using 3 of these pumps?
Give your answer in hours and minutes.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]



14. A sector of a circular metal plate centre O , with radius 18 cm, is removed to leave the following shape.

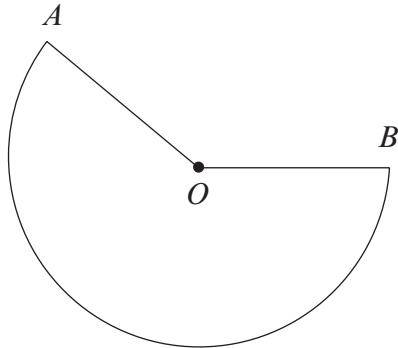


Diagram not drawn to scale

The length of the arc AB of the shape is 66 cm.

- (a) Calculate the size of the reflex angle AOB correct to the nearest degree.

.....

.....

.....

.....

.....

.....

.....

.....

[3]

- (b) What was the area of the piece of metal that was removed?

.....

.....

.....

.....

.....

.....

.....

[2]



