

Surname	Centre Number	Candidate Number
Other Names		0



GCSE LINKED PAIR PILOT

4361/01



S15-4361-01

APPLICATIONS OF MATHEMATICS

UNIT 1: Applications 1 FOUNDATION TIER

A.M. THURSDAY, 4 June 2015

1 hour 30 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	12	
2.(a)	8	
2.(b)(c)	7	
2.(d)(e)	9	
3.(a)	7	
3.(b)	3	
4.	9	
5.	5	
6.	7	
7.	8	
8.	5	
Total	80	

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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.

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.

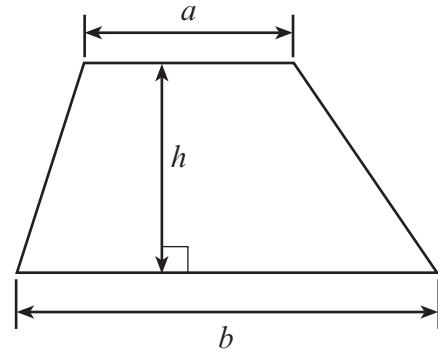
Scale drawing solutions will not be acceptable where you are asked to calculate.

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 2(a).

Formula List

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



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



1. A celebrity has been given a challenge to raise money for charity.
The challenge is for the celebrity to sit on each of the 45 000 seats in a sports stadium.



The celebrity must:

- sit on 9000 seats in one day,
- sit on each seat for 4 seconds.

(a) How many days will it take to complete the challenge? [2]

.....

.....

(b) How many seats is the celebrity expected to sit on in a minute? [2]

.....

.....

(c) (i) Calculate the number of hours each day that the celebrity will sit on seats in the stadium. [4]

.....

.....

.....

.....

.....

.....

.....

(ii) Explain why the time taken for the challenge is likely to be longer. What have the organisers not taken into consideration? [1]

.....

.....

(d) The celebrity hopes to raise £180 000 for charity.
The celebrity has already raised $\frac{1}{3}$ of this amount.
How much more money does he hope to raise? [3]

.....

.....

.....

£

2. Mr Jones lives in Orchard Close where the residents decide to hold a street party to celebrate his 90th birthday.



- (a) *You will be assessed on the quality of your written communication in this part of the question.*

Including Mr Jones, there are 22 residents who live in Orchard Close.

The other 21 residents each contribute £10 towards the party.

Mr Jones' birthday cake is given free by the local baker.
Residents bring their own drinks.

12 large packets of crisps are bought for £1.89 each.
The local baker supplies 22 plates of sandwiches at £3.50 each.
44 sausage rolls are bought from the local baker for a total of £23.89.
4 large bowls of salad are bought for £8.99 each.
The total cost of the material for the tables and decorations is £50.

Does the money given by the residents cover the costs for all the items bought for the street party?

You must show all your working.

[8]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

8

(b) A stand with a circular top is made to hold the birthday cake.
The radius of the circle is 30 cm.
Draw an accurate diagram of the circle, **using a scale of 1 cm to represent 5 cm.** [2]

4361
010005

- (c) Decorations are made to decorate the tables for the street party. They are made in the shape of right-angled triangles, as shown below.

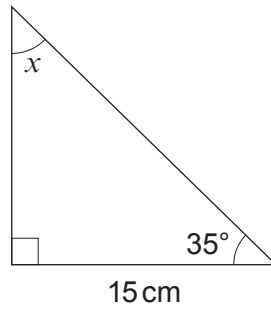


Diagram not drawn to scale

- (i) Calculate the size of the angle x . [2]

.....

.....

- (ii) Draw accurately the right-angled triangle shown above. [3]

- (d) (i) A rectangular sheet of material is needed to cover each of the 5 rectangular tables for the street party.
The dimensions of each rectangular sheet are 150 cm by 80 cm.
What is the total area of material needed?
Clearly state the units of your answer. [4]

.....

.....

.....

- (ii) The 5 tables for the street party are joined together.
It is possible for two people to sit at each of the longer sides of a rectangular table.
It is possible for one person to sit at each of the shorter sides of a rectangular table.
Draw a diagram to show where the 22 people of Orchard Close will sit. [2]

- (e) At the street party, two raffle tickets are given to each resident.
What is the probability that Mr Jones wins the first prize in the raffle?
Give your answer in its simplest form. [3]

.....

.....

3. (a) You are asked to check Paige's revision homework. She has answered all 10 questions. The revision homework questions and Paige's answers are given in the table below.

Question number	Question	Paige's answer
1.	Change 4.5 cm into mm.	45 mm
2.	Find the value of 2^3 .	6
3.	Simplify $6y - y$.	6
4.	Is 6 a factor of 12?	Yes
5.	What word would you use to describe the chance that the next day after Sunday is Monday?	Likely
6.	Approximately how many pints are there in a litre?	$1\frac{3}{4}$ pints
7.	What is $\frac{1}{2}$ of $8a$?	$4a$
8.	What is the probability of obtaining a number greater than 5 on one throw of a fair 6-sided dice?	$\frac{1}{3}$
9.	What is the name of a quadrilateral that has only one pair of parallel sides?	Kite
10.	If $x = 3$, what is the value of $x - 7$?	4

Complete the table below to indicate whether Paige's answers are correct or not. If any of her answers are incorrect, you must give the correct answer. The first one has been completed.

[7]

Question number	Correct? Yes or No	If No, give the correct answer
1.	Yes	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Extra working space

.....

.....

.....

.....

7

(b) Paige's revision homework is always marked out of 10.
 Her last 3 marks for her homework have a median of 7, a range of 4 and a mode of 7.
 Complete the boxes below to show the last 3 marks that Paige had for her revision homework. [3]

Working:

.....

.....

.....

--	--	--

3

4361
010009

4. One day, Gary cycles from his house to a café 15 miles away.
He leaves his house at 11 a.m. and cycles for an hour to the café.
He stops at the café for half an hour to have a drink.
He then heads home but stops after $\frac{3}{4}$ hour to fix a puncture 4 miles from his house.
It takes him 15 minutes to fix the puncture.
He then cycles the last 4 miles back home at a speed of 8 miles per hour.

(a) On the graph paper below, draw a travel graph to show Gary's journey.

[6]



Extra working space

.....

.....

.....

.....

.....

.....

(b) Using your graph, state what time Gary arrived home after his cycle ride. [1]

.....

(c) At what time in the afternoon was Gary 13 miles away from the café? [2]

.....

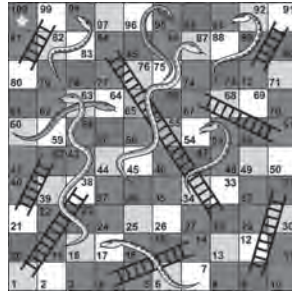
.....

.....

9

BLANK PAGE

5. *Vintage Games* makes board games such as snakes and ladders.



Vintage Games decides to make a biased spinner to include with their board games. The spinner is numbered 1 to 4. The probability of scoring each of the numbers has been decided.

Number	1	2	3	4
Probability	0.1	0.3	0.4

- (a) Complete the table.

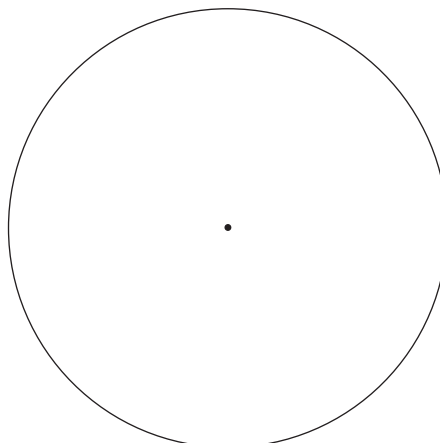
[1]

.....

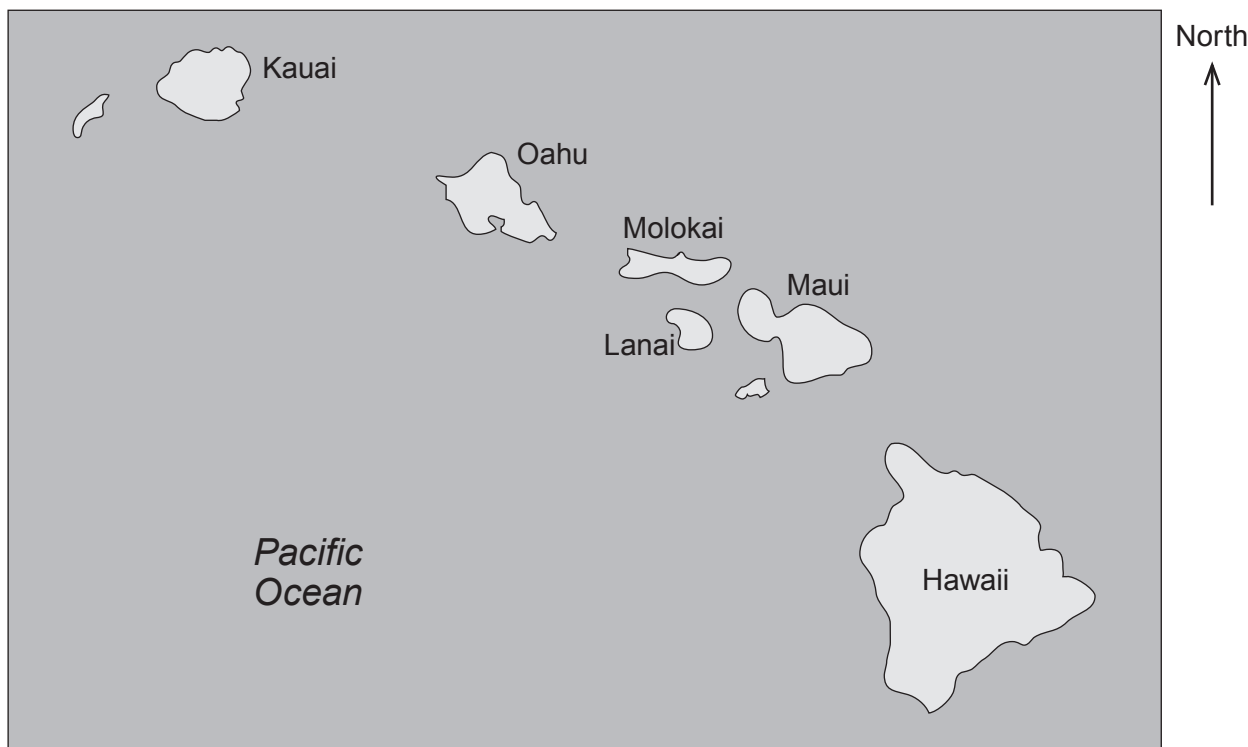
- (b) An outline of the biased spinner to be made by *Vintage Games* is shown below. The centre of the spinner has been marked. Using the information in the table, complete an accurate drawing of the biased spinner. You must show your working.

[4]

.....



6. The state of Hawaii in the USA consists of 8 main islands.
The six largest of these islands are Hawaii, Maui, Oahu, Kauai, Molokai and Lanai.



- (a) The land area of Oahu is 596.7 square miles.
1 square mile is approximately 2.59 km^2 .
Calculate the land area of Oahu in km^2 .
Give your answer correct to 3 significant figures.

[3]

.....

.....

.....

(b) Place points on the diagram to mark the approximate centres of the islands of Kauai and Maui.

(i) Use these two central points to complete the sentence below. [3]

The island of Kauai is on a bearing of from the island of Maui.

.....
.....

(ii) Why is there a risk that your answer for the bearing may not be completely accurate? [1]

.....
.....
.....

7

7. *EcoEstates* has considered the dimensions of rectangular sports halls. The dimensions have been expressed algebraically, as shown on the plan.

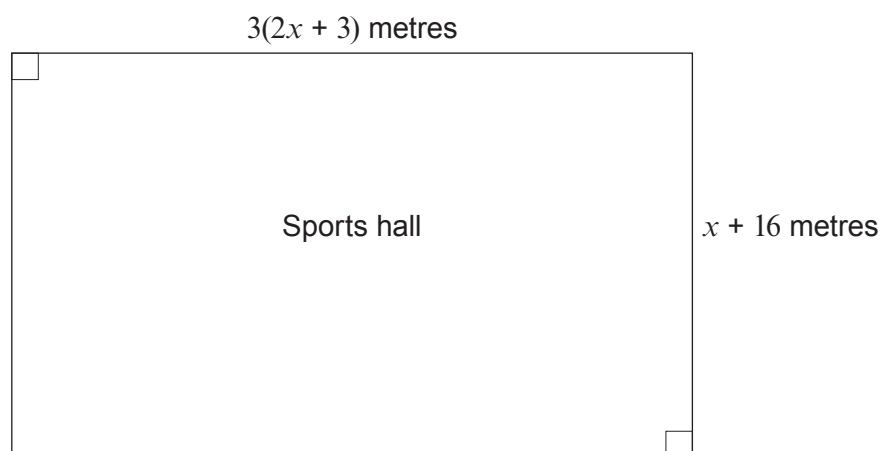


Diagram not drawn to scale

- (a) Find the perimeter of a sports hall in terms of x .
Express your answer in its simplest form.

[4]

.....

.....

.....

.....

.....

.....

- (b) Find the dimensions of the sports hall when $x = 4.5$.

[2]

.....

.....

.....

Length = metres

Width = metres

- (c) The area of the floor of a sports hall, in m^2 , is given by the formula shown below.

$$\text{Area} = 6x^2 + 105x + 144$$

Calculate the area of the floor of the sports hall when $x = 4$.

[2]

.....

.....

.....

.....

.....

.....

.....

.....

Examiner
only

8

8. *Fisher Tours* has a new coach.



- (a) On Sunday, the coach took 45 passengers on a trip to the zoo. The ratio of men to women to children was 2 : 3 : 4. How many children were on the coach?

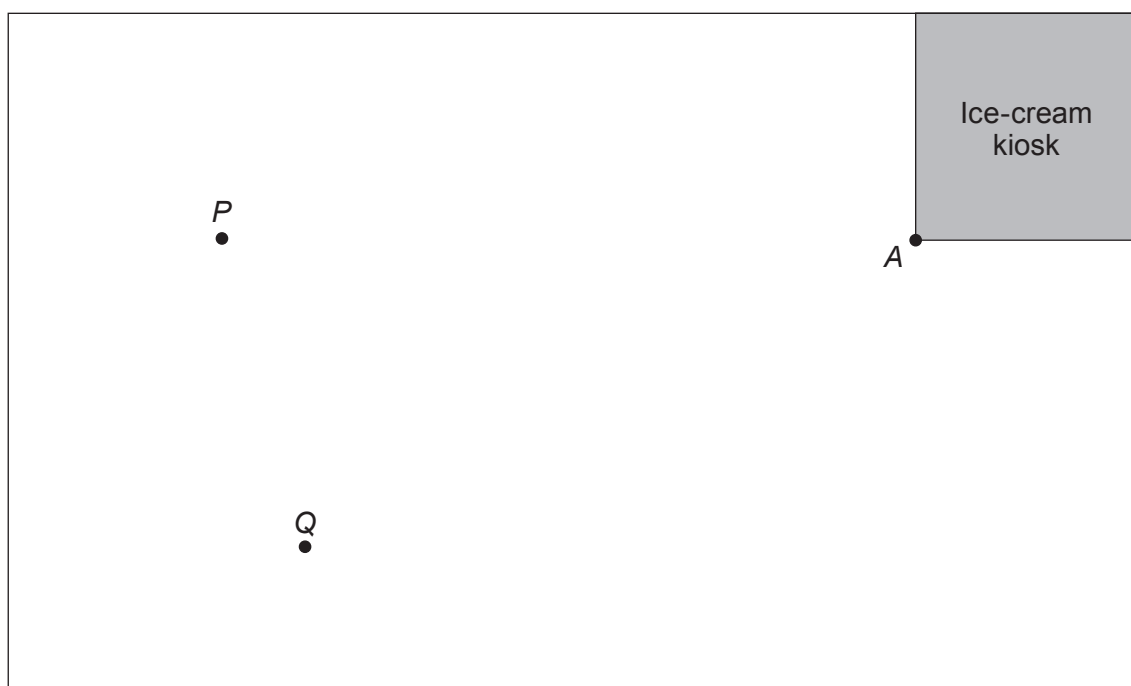
[2]

.....

.....

.....

- (b) When *Fisher Tours* takes a coach trip to the zoo they must follow instructions for parking. An accurate scale drawing of the entire coach-parking zone at the zoo is shown below. *Fisher Tours* has been allocated a parking area within this parking zone.



Scale: 1 cm represents 4 metres

The instructions for parking are as follows:

- Must be further than 12 metres away from point A at the ice-cream kiosk.
- Must be closer to the lamp post Q than to lamp post P.

Indicate, on the scale drawing above, the region in which *Fisher Tours* can park their coach.

[3]

END OF PAPER

BLANK PAGE