

Candidate Name	Centre Number	Candidate Number
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GCSE LINKED PAIR PILOT

4361/01

APPLICATIONS OF MATHEMATICS

UNIT 1: APPLICATIONS 1

FOUNDATION TIER

A.M. TUESDAY, 21 June 2011

1½ hours

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.

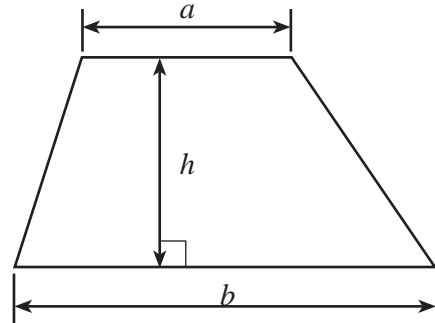
The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 17.

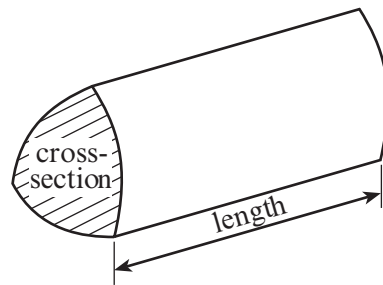
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	8	
2	7	
3	3	
4	4	
5	6	
6	4	
7	4	
8	4	
9	2	
10	3	
11	3	
12	4	
13	3	
14	6	
15	6	
16	5	
17	8	
TOTAL MARK		

Formula List

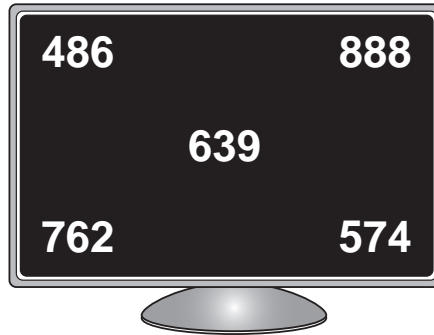
Area of trapezium = $\frac{1}{2}(a + b)h$



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



1. (a) A game shows numbers on a screen.



Write down the numbers which are

(i) smaller than 865 AND greater than 535,

..... [1]

(ii) smaller than 865 AND greater than 535 AND even,

..... [1]

(iii) smaller than 865 AND greater than 535 AND even AND divisible by 3.

..... [1]

(b) The following table shows the costs to see a film in the cinema.

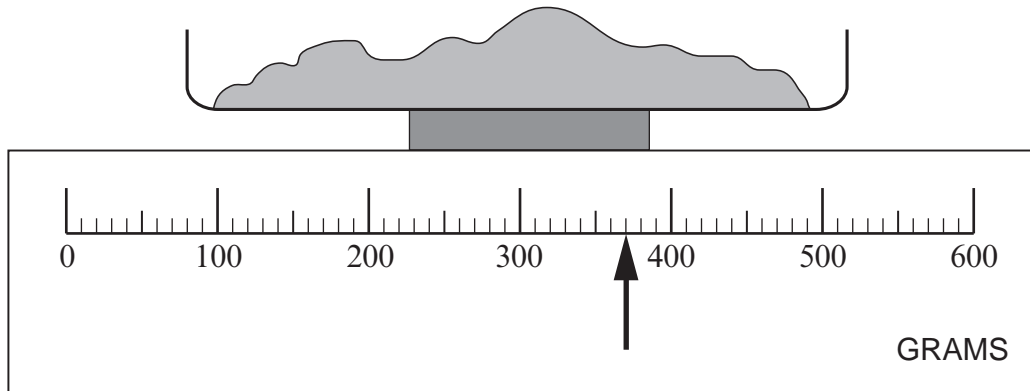
	Mon, Wed, Thurs, Sun	Fri & Sat	Tues
Adult	£6.40	£6.75	£3.20
Concession	£4.70	£4.85	£2.65
Child	£4.30	£4.55	£2.30

Two adults and three children want to go to the cinema to see the latest blockbuster. How much would they save altogether if they go on a Tuesday rather than a Wednesday?

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[5]

2. (a) The scale is used to weigh sugar for making a cake.



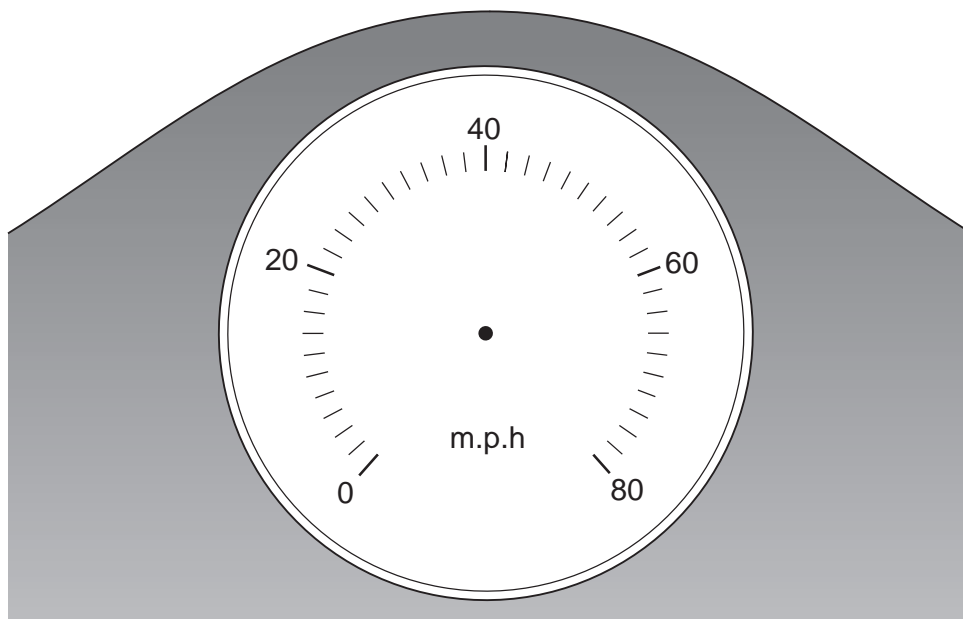
What does the sugar weigh?

Weight of sugar = grams

[1]

- (b) Draw an arrow on the following speedometer to show a speed of 48 m.p.h.

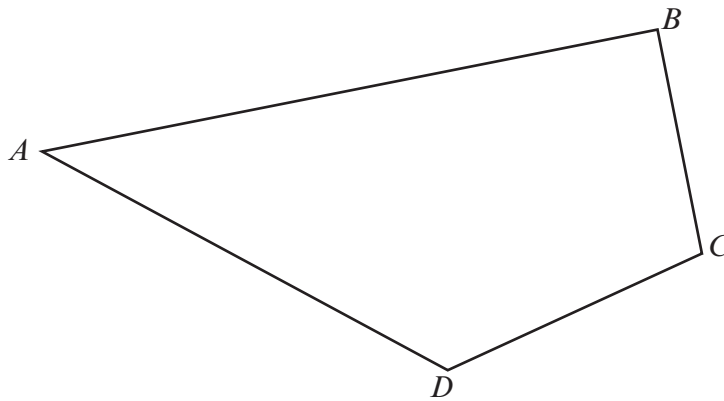
[1]



- (c) Draw a circle with a radius of 5 cm.

[1]

- (d) A piece of a jigsaw $ABCD$ is shown below.



Measure and write down

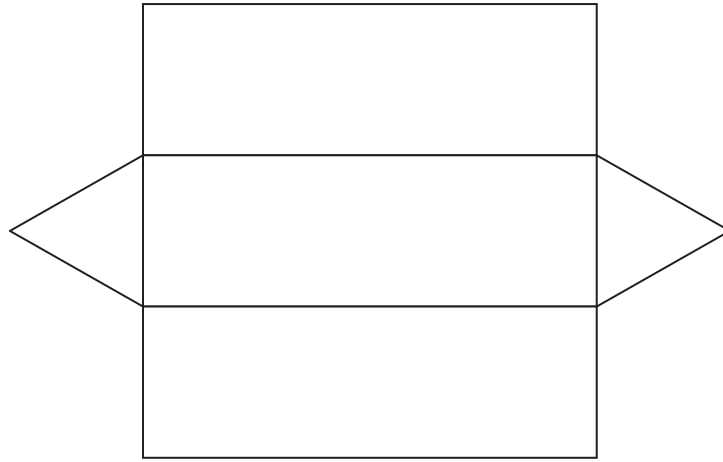
- (i) the size of \widehat{ADC} ,

..... [1]

- (ii) the length of the line that is perpendicular to BC .

..... [1]

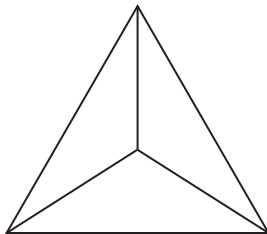
- (e) The net of a gift box is shown below.
What is the name of the 3D shape made from this net?



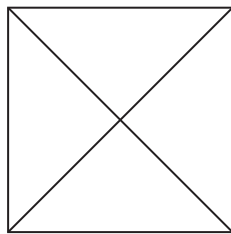
Name =

[1]

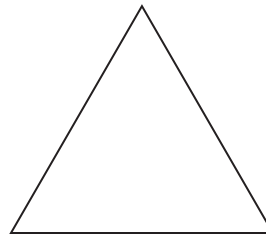
- (f) The shape of another gift box is a triangular based pyramid (tetrahedron).
Which of the following diagrams shows the top view of this gift box?



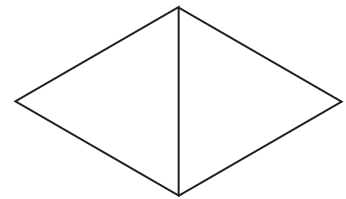
A



B



C

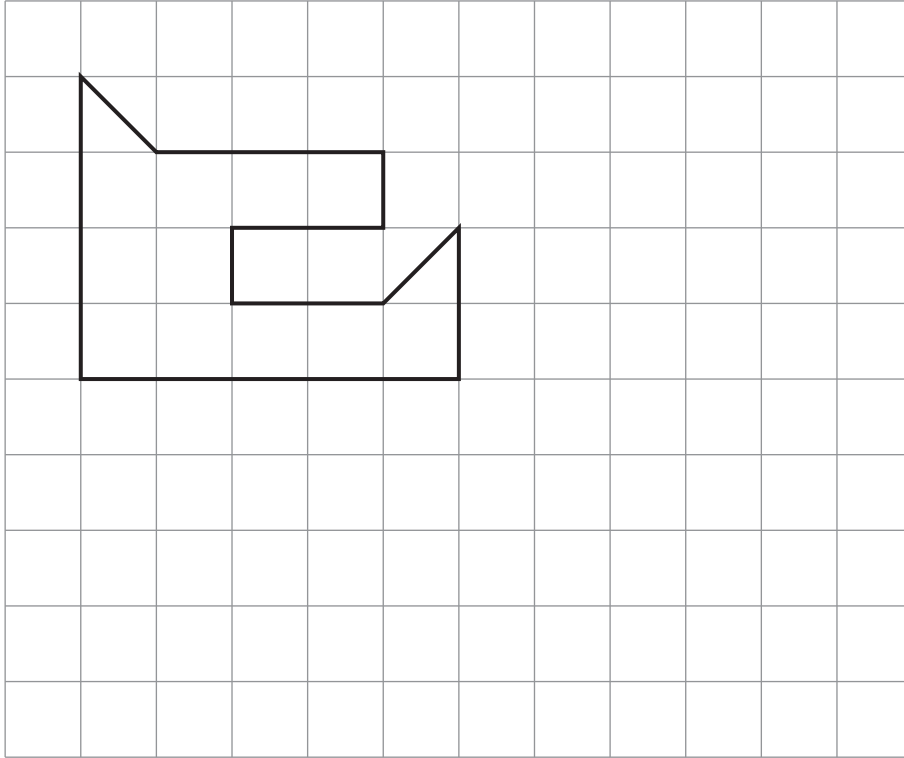


D

Diagram =

[1]

3. Jane was asked by her advertising company to design a logo. Jane's initial logo is shown below on the centimetre square grid.



- (a) What is the area of Jane's initial logo?

.....

[1]

- (b) The company decides that they want a simple logo of a rectangular shape but want to use the same area as Jane's initial design.
On the grid above, draw a possible shape of the new logo.

[2]

4. The information in the table below was printed in a daily newspaper during the month of December.

City	Maximum daytime temperature ($^{\circ}\text{C}$)	Minimum night-time temperature ($^{\circ}\text{C}$)
Cardiff	6	-3
Moscow	-5	-14
Sydney	26	13
Helsinki	-1	-9
Cape Town	30	18

Use the given information to answer the following.

- (a) Which city had the lowest minimum night-time temperature?

..... [1]

- (b) Which city had the highest maximum daytime temperature?

..... [1]

- (c) What is the difference between the minimum night-time temperatures in Cardiff and Sydney?

..... [1]

- (d) Which **two** cities had a difference of 7°C in their maximum daytime temperatures?

..... [1]

5. Angharad plays netball for her local team. The number of goals she has scored in her first seven games is 3, 4, 5, 5, 6, 8 and 9.

(a) Explain why the mode is 5.

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[1]

(b) Calculate the mean number of goals scored by Angharad in the first seven games.

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[3]


(c) Angharad’s coach thinks that it is possible for Angharad to achieve a median of 6 and a range of 7 after two more games are completed.
Give the possible number of goals scored in each of the next two games that would allow Angharad to achieve this.

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[2]

6. A taxi firm advertisement is shown below.

Fred's Cabs



Taxi Fare = Number of miles travelled \times £1.80 + £3.10

- (a) Samina travels by taxi from the train station to her home which is 24 miles from the station. How much will her taxi fare be?

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[2]

- (b) Ciaran travelled by taxi.
He paid £37.30 for the journey.
How many miles did Ciaran travel?

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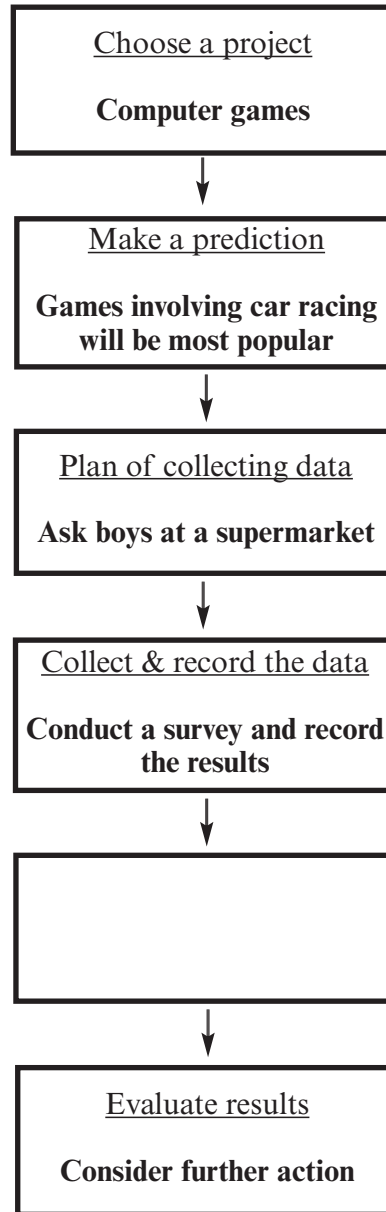
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[2]

8. (a) Sam wants to investigate which computer game is the most popular. He decides to plan what he needs to do in order to carry out his investigation. The following shows some of the steps that Sam has planned so far.



- (i) What do you think the missing step is in Sam's plan?

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[1]

- (ii) Suggest a way of improving the third step, 'Plan of collecting data', in Sam's plan.

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[1]

(iii) What type of diagram could Sam use to present the data that he has recorded?

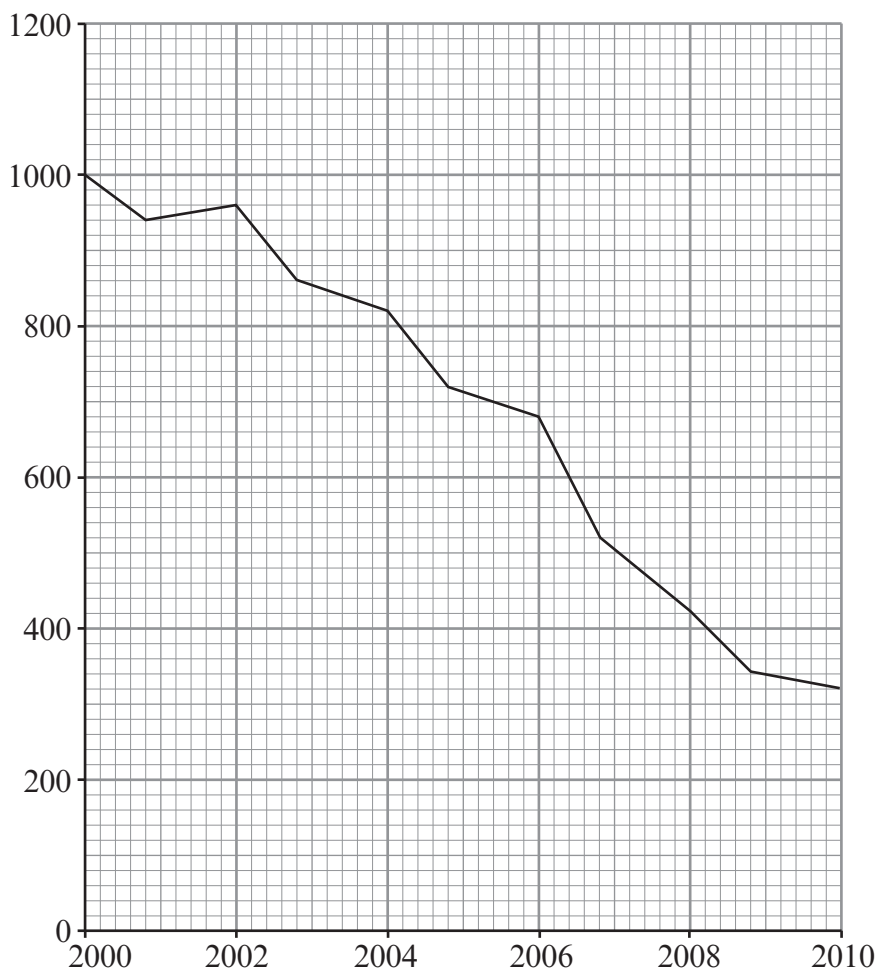
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[1]

(b) Sam's friend Siân investigates the sales of board-games in a local shop. The following graph shows her results for the sales of board-games over the past 10 years.

Sales of board-games



Comment on Siân's results of the sales of board-games over the past 10 years.

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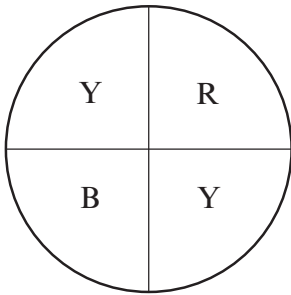
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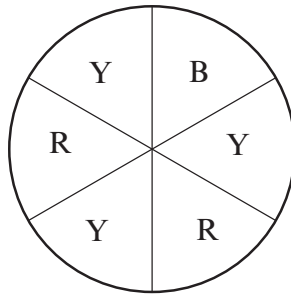
[1]

9. Kyle and Ethan play a game using a spinner. A player wins when the spinner stops on their chosen colour. A player can choose from the colours Yellow (Y), Black (B) or Red (R). Kyle always chooses Red. Ethan always chooses Yellow. Which of the following spinners should Ethan choose so that he has the greatest chance of beating Kyle? Give a reason for your answer.

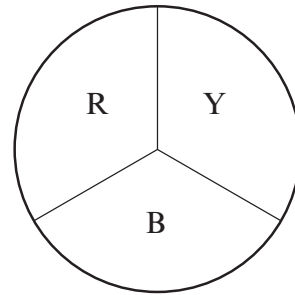
SPINNER 1



SPINNER 2



SPINNER 3



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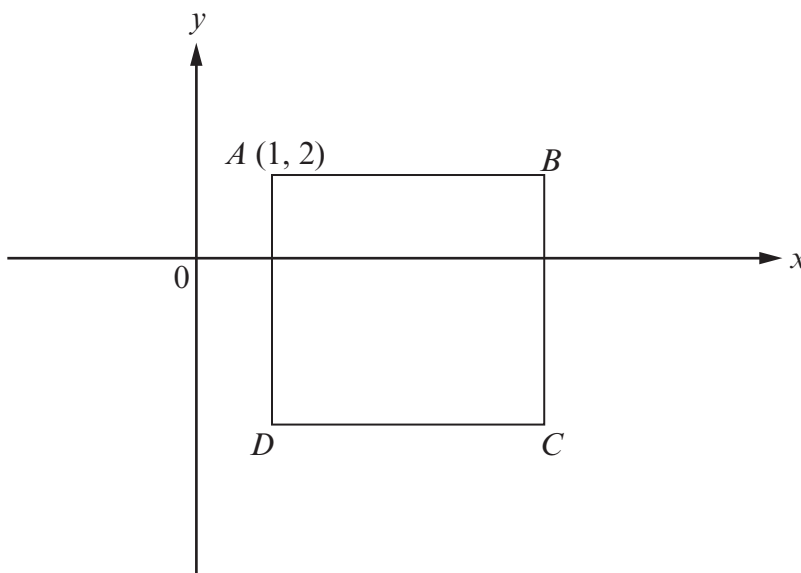
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[2]

10. A square, $ABCD$ has sides of length 5 units.
Find the coordinates of point C .



Coordinates of $C = (\dots\dots\dots, \dots\dots\dots)$

[3]

11. (a) Find the value of $\frac{4 \cdot 32^3 - 12 \cdot 6}{\sqrt{25 \cdot 8}}$, giving your answer to 2 decimal places.

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[2]

- (b) The number of people who bought tickets for a pop concert was 56 721.
Round this value to 2 significant figures.

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[1]

12. Charlie has x sweets.
Lisa has 3 more sweets than Charlie.
Julian has twice as many sweets as Lisa.
How many sweets do Charlie, Lisa and Julian have altogether? Simplify your answer as far as possible.

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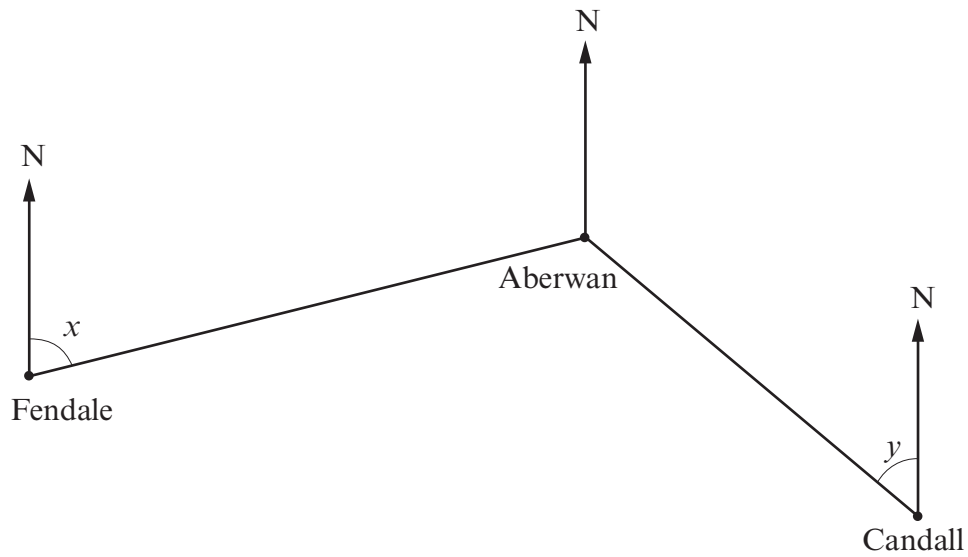
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[4]

14. The diagram shows three places Fendale, Aberwan and Candall in the positions that they would appear on a map drawn to scale.



- (a) Measure the angles marked x and y on the diagram.

$x = \dots\dots\dots^\circ$
 $y = \dots\dots\dots^\circ$
 [2]

- (b) Find the bearing of

- (i) Aberwan from Fendale,

..... [1]

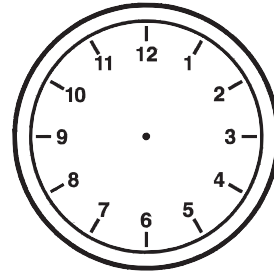
- (ii) Fendale from Aberwan.

..... [1]

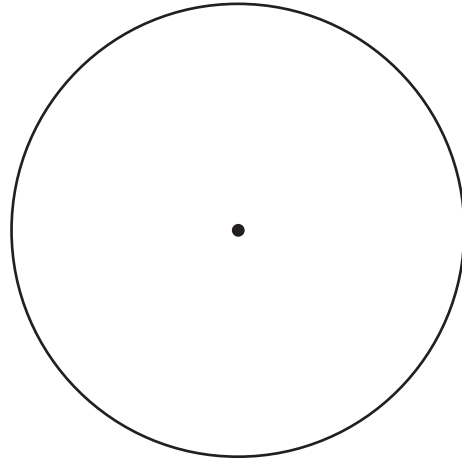
- (c) Find the bearing of Aberwan from Candall.

..... [2]

15. (a) A clockface is to be designed using a single dot in place of each number.



Use the circle opposite to mark accurately the positions of the 12 dots on the clockface. The centre of the clock has been marked for you. You **must** show **all** your lines joining the centre of the clock to the dots.



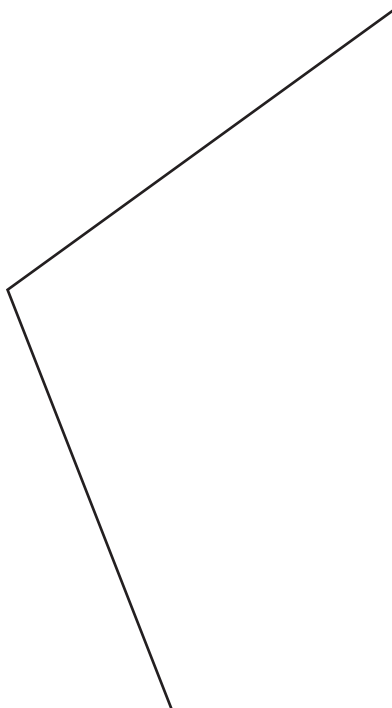
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[3]

- (b) Use a pair of compasses and a ruler to bisect the obtuse angle shown below. You **must** show **all** of your construction marks on the diagram.



[3]

16. Davina is entering a kite flying competition.
To enter the competition, Davina's kite must meet all the requirements below.

- The diagonals of the kite are perpendicular.
- The shorter diagonal must be 25 cm.
- The longer diagonal must be 48 cm.
- The shorter diagonal of the kite must cut the longer diagonal in the ratio 3:5.

Using a scale of 1:5, construct a scale drawing of Davina's kite for the competition.
You **must** show **all** your working.

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[5]

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17. You will be assessed on the quality of your written communication in this question.

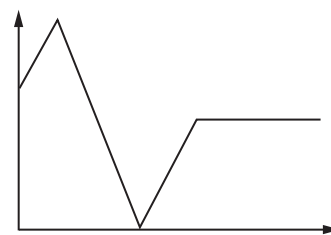
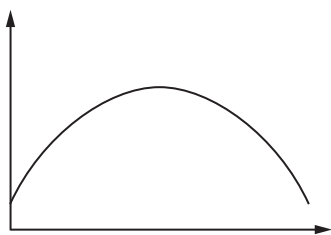
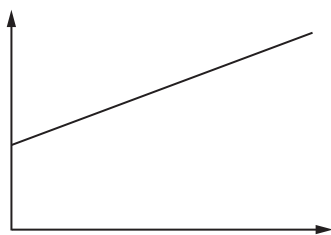
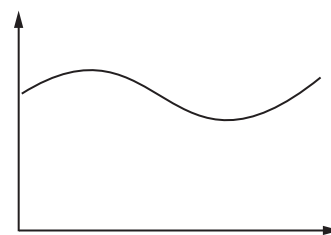
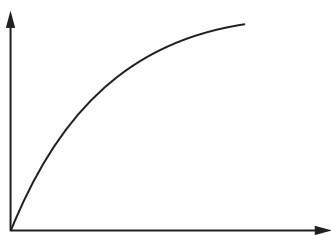
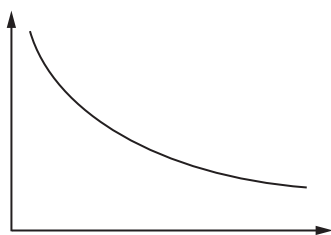
Michelle has cut out two headlines and a number of graphs from newspapers. She has cut off the labels and scales from the graphs so that she is left with simple sketches of the original graphs.

Each headline originally had a matching graph.

Headlines

- More ice creams are sold in the summer than in the winter in South Wales.
- Vast increase in sales of bicycles in the South East of England.

Michelle's sketches of the graphs

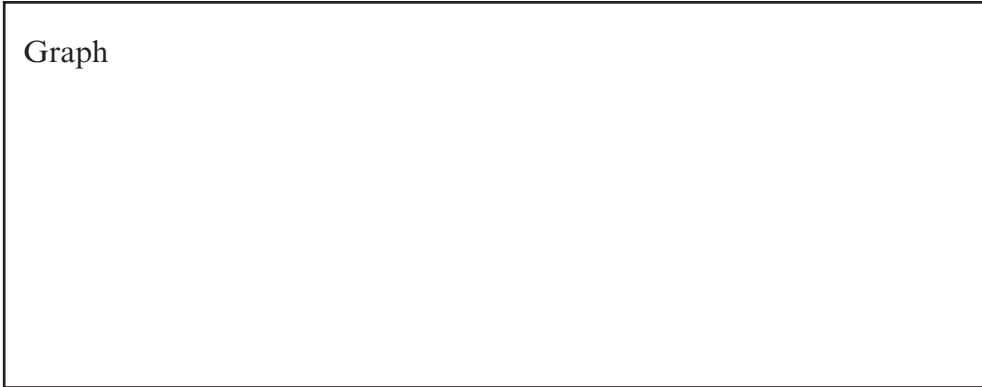


On the opposite page, for **each** of the headlines

- select an appropriate sketch from above and draw it in the box opposite,
- label the axes,
- explain why the graph matches the headline.

- More ice creams are sold in the summer than in the winter in South Wales.

Graph



Explanation

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- Vast increase in sales of bicycles in the South East of England.

Graph



Explanation

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