

Surname	Centre Number	Candidate Number
Other Names		0



**GCSE LINKED PAIR PILOT**

4361/01

**APPLICATIONS OF MATHEMATICS  
UNIT 1: APPLICATIONS 1  
FOUNDATION TIER**

A.M. WEDNESDAY, 13 June 2012

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  $\pi$  as 3·14 or use the  $\pi$  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.

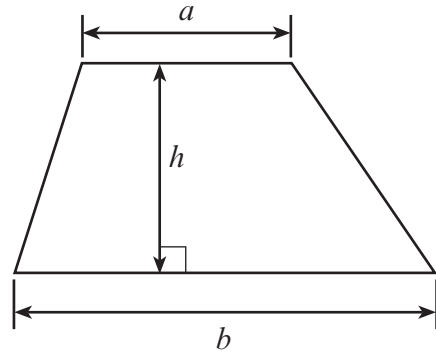
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 6.

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

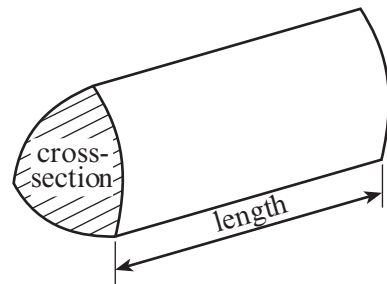
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**Formula List**

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



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



1. Information about a sports car is given in the table below.



Engine size (cc)	Weight (kg)	Time from 0 mph to 60 mph (sec)	Top Speed (mph)	Price (£)
6498	1576	2.9	217	231 399

Express

- (a) the weight of the sports car to the nearest 10 kg,

..... [1]

- (b) the engine size to the nearest 1000 cc,

..... [1]

- (c) the price to the nearest £10 000,

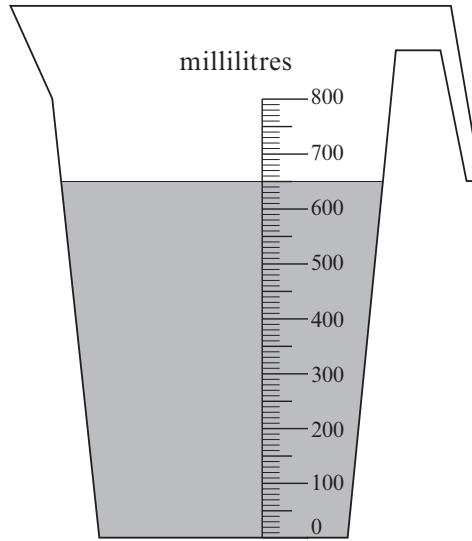
..... [1]

- (d) the time, from 0 mph to 60 mph, to the nearest second.

..... [1]

2. (a) The following measuring instruments were used to prepare dinner in a kitchen.

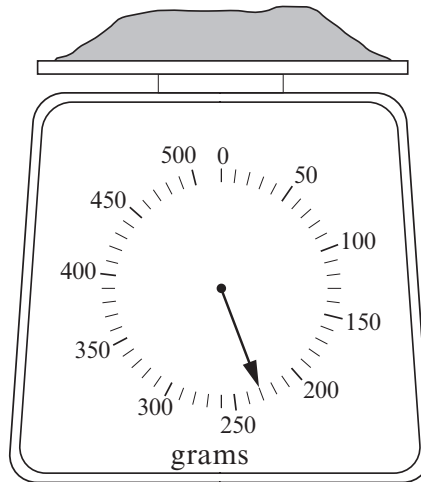
(i) What is the volume of the liquid in the jug?



[1]

Volume of liquid is ..... millilitres.

(ii) How much flour is being weighed?

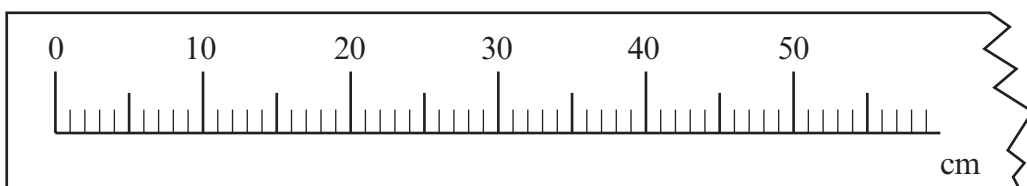


[1]

The flour weighs ..... grams.

(iii) A baking tray of length 36 cm is needed.  
Draw an arrow on the measuring tape to show this length.

[1]

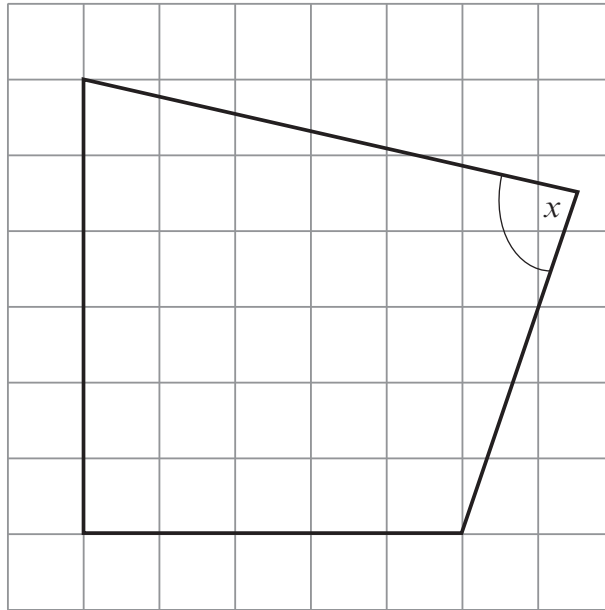


- (b) A birthday cake is made in the shape of a triangular sail on a boat.  
The dimensions of the sail are 45 cm, 33 cm, and 24 cm.  
Draw an accurate diagram of the sail, using a **scale of 1 cm to represent 3 cm**.

The line representing the 45 cm side has already been drawn for you.

[3]

3. A scale drawing of a bedroom floor is drawn on the centimetre square grid below.



- (a) If 1 square cm represents 1 square metre, estimate the area of the bedroom floor.

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 .....

Area = ..... square metres.

[2]

- (b) Measure the size of angle  $x$ .

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[1]

- (c) Circular pictures of planets are going to be placed on the walls of the bedroom.  
A template needs to be drawn.  
Make an accurate drawing of the circular template.  
The radius of the template is 5.7 cm.

[1]

4.

## The Perfect Pizza Company

Pizza	Thin base		Deep base	
	Small	Medium	Small	Medium
Margherita	£6.79	£8.49	£7.79	£9.49
Pepperoni	£7.39	£9.69	£8.39	£10.69
Chicken Feast	£7.49	£9.79	£8.49	£10.79
Veggie Supreme	£7.29	£9.29	£8.29	£10.29
Hot & Spicy Meat Feast	£8.49	£9.99	£9.99	£11.99

**Stuffed crust pizza - £1.50 more than deep base option.**

**Delivery charge of £2.50 added to the total cost of the order.**

Paul and his friends order some pizzas to be delivered.

They order

- a small deep base Veggie Supreme,
- a medium Chicken Feast stuffed crust
- and two medium thin base Hot & Spicy Meat Feasts.

(a) Calculate the total cost of the order including the delivery charge.

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[5]

(b) Paul only has £10 notes.  
How many £10 notes will be needed to pay the delivery man?

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[1]



5. (a) An approximate relationship between your height, measured in cm, and the length of your forearm, measured in cm, is given by the formula:

$$\text{Height} = 4 \cdot 3 \times \text{length of forearm} + 62$$

- (i) A child's forearm is 10 cm long. Use the formula to find the child's height.

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[2]

- (ii) An adult's height is 191 cm. Use the formula to calculate the length of the adult's forearm.

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[2]

- (b) Simone is asked to add  $3\frac{1}{10}$  and  $4\frac{8}{9}$ .

She **estimates** the answer to the nearest whole number.

**Explain** how Simone may have found her **estimate** and write down what this **estimate** would be.

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[2]

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

A bricklayer builds a garden wall using 1500 bricks.



- Bricks cost £0.72 each.
- The bricklayer charges £200 for every 500 bricks he lays.
- 1.5 tons of sand are used at £42 per ton.
- 16 bags of cement are used at £4.90 per bag.

What is the total cost of building the wall?

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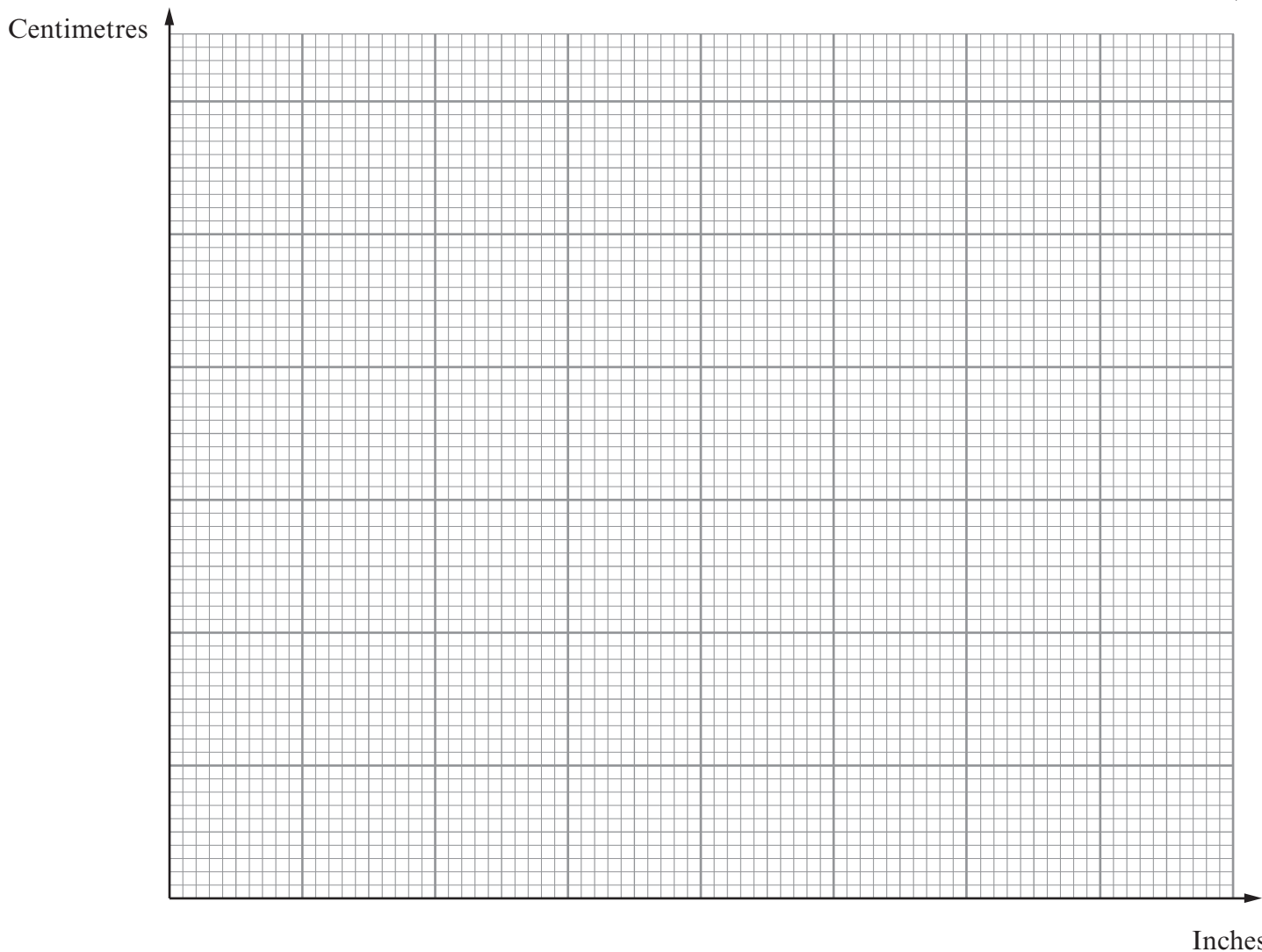
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[9]

7. A dressmaker uses the following information to convert between inches and centimetres.

Inches	2	7	12
Centimetres	5	17.5	30

(a) Use this information to draw a conversion graph for inches and centimetres on the graph paper below. [4]



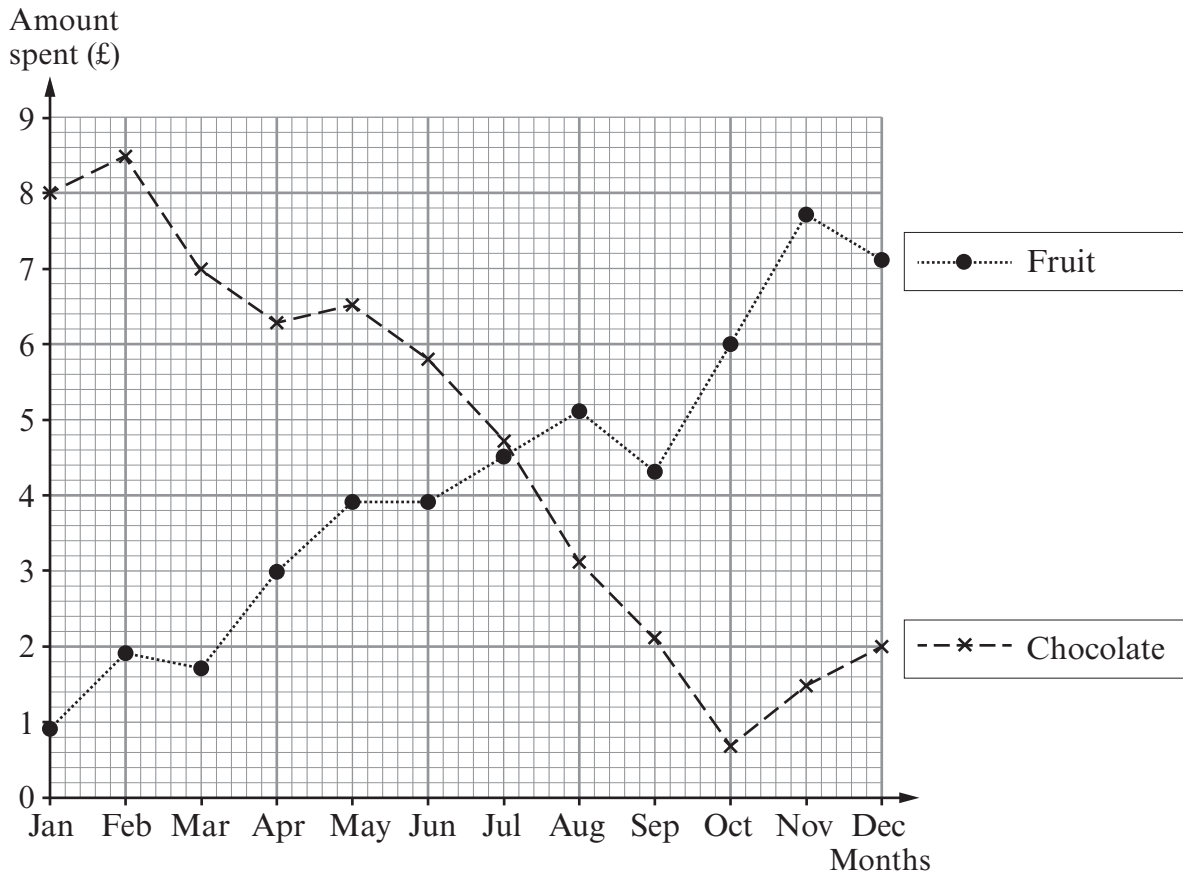
(b) The length of a sleeve on a dress is 9 inches.  
How many centimetres is this?

[1]

(c) A dressmaker has a skirt of length 70 centimetres.  
Find the length of the skirt in inches.  
Explain how you obtained your answer.

[2]

8. The graph shows the amount that a teenager spent each month on chocolate and fruit during 2011.



(a) How much did the teenager spend on fruit in April?

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[1]

(b) Describe the trend in the amount the teenager spent on fruit and the trend in the amount the teenager spent on chocolate.

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[2]

9.



The number of pairs of shoes sold by Mrs Thomas on different days were

49    43    58    42    67    74    78    40    60    89.

Mr Richards sold 402 pairs of shoes in total over a period of 7 different days.  
On average, who had the greater daily sales?  
Show all your working.

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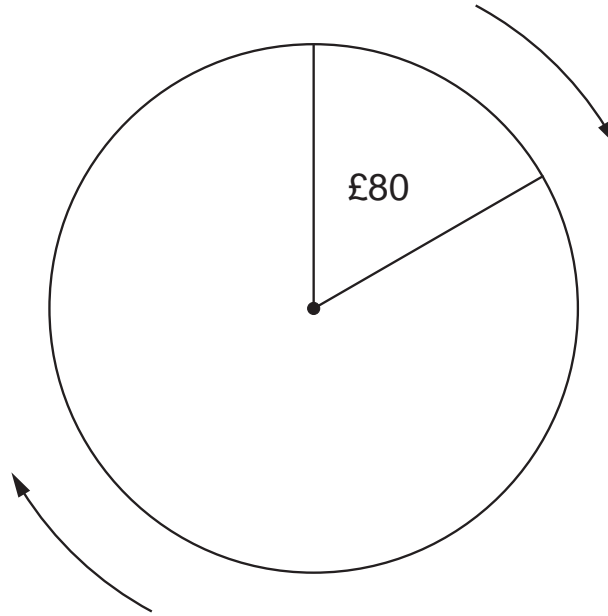
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[5]

10. A prize wheel for a television game show is made from a large circular piece of wood. The prize wheel is divided into six equal parts. The parts are labelled £80, £50, £200, £0, £500 and £4000.

(a) Complete the drawing of the prize wheel. The £80 part has been drawn for you. [2]



(b) Each time the prize wheel is spun, it stops on one part.

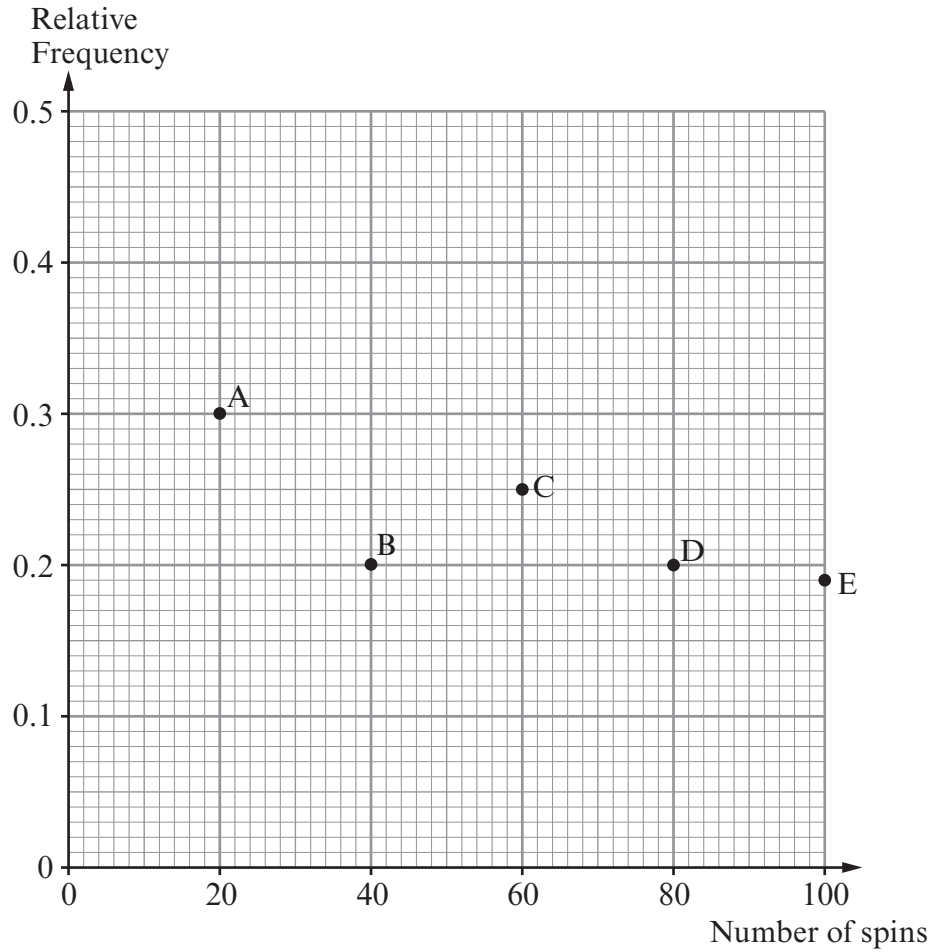
(i) What is the probability that £4000 is won on the first spin?

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 ..... [1]

(ii) What is the probability that £4000 is won on the second spin?

.....  
 ..... [1]

- (c) The relative frequency of winning £4000 was calculated after a total of 20 spins, 40 spins, 60 spins, 80 spins and 100 spins. The results were plotted on the graph below.



Which of the readings, noted by the letters A, B, C, D and E on the graph, is likely to give the best estimate of the probability of winning £4000 when the prize wheel is spun? You must give a reason for your answer.

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[2]

11. Bethan has  $x$  pounds.

Rhys has 5 pounds more than Bethan.

Kieran has three times as much as Rhys.

Write an expression, in terms of  $x$ , for the total amount in pounds, that Bethan, Rhys and Kieran have altogether. Give your answer in its simplest form.

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Total amount = ..... pounds

[4]

12. Mrs. Denis has a circular dining table with a diameter of 1.5 metres.

(a) What is the area of the top surface of the table?

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[2]

(b) Mrs. Denis needs to put an edging strip around the table.  
What is the circumference of the table?

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[2]



13. A chart is kept to show the position of a yacht at three times during the day. These are the notes that have been kept in order to plot the positions of the yacht on the chart.

Notes:

- Start time was 12 noon
- At 13:00 its position was 6 nautical miles on a bearing of  $134^\circ$  from the start
- At 14:00 its position was 4 nautical miles on a bearing of  $200^\circ$  from its position at 13:00

- (a) Use a scale of **1 cm to represent 1 nautical mile** to complete the chart.

[3]



- (b) Write down the bearing of the yacht and its distance from the start position at 14:00.

.....  
Bearing ..... $^\circ$

Distance ..... nautical miles

[2]

14. You are asked to check Damian's homework.  
He has answered 8 questions.  
The homework questions and Damian's answers are given in the table below.

Question number	Question	Damian's answer
1	Calculate $48 + 62$	100
2	Simplify $7y + y - 3y$	$4y$
3	Simplify $3a - 5b + 26a - 26b$	$29a + 31b$
4	Expand $6(x + 2)$	$6x + 12$
5	Simplify $3(2x + 5) - (x - 3)$	$5x + 12$
6	Factorise $24x + 8$	$8(3x + 0)$
7	Factorise $3x + 15$	$3(x + 5)$
8	Find the value of $2a - 3b$ when $a = 6$ and $b = -4$	0

Complete the table below to indicate if Damian's answers are correct or not.  
If any of his answers are incorrect, you must give the correct answer.

Question number	Correct? Yes or No	If no, give the correct answer
1	No	110
2		
3		
4		
5		
6		
7		
8		

Extra working space

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[6]

15. A fishing competition is to be held out at sea in a rectangular area that is 5 km by 4 km and marked out by buoys. Safety boats are positioned at two different corners of the rectangular area marked out by the buoys.  
Each safety boat patrols an area not exceeding 3 km from its initial position.

Consider the options for positioning the two safety boats.  
Decide which of your options is best for positioning the two safety boats.  
You must clearly show and explain why your solution is the best option.

Explanation:

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[5]