



General Certificate of Secondary Education  
2015

Centre Number

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Candidate Number

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# Mathematics

Unit T2 (With calculator)  
Foundation Tier



[GMT21]



\*GMT21\*

**THURSDAY 21 MAY, 9.15 am–10.45 am**

### TIME

1 hour 30 minutes.

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page, on blank pages or tracing paper.**

Complete in blue or black ink only. **Do not write with a gel pen.**

Answer **all twenty-eight** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in **Questions 9 and 13.**

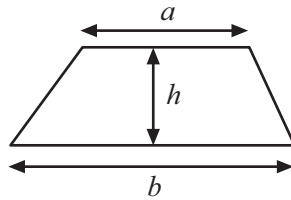
You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

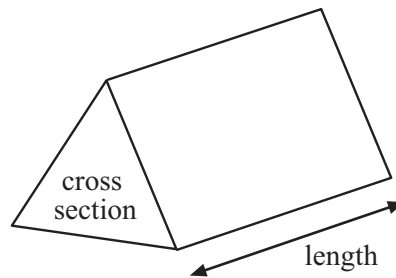


# Formula Sheet

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



$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$



1 Write down the next two terms in the following sequence

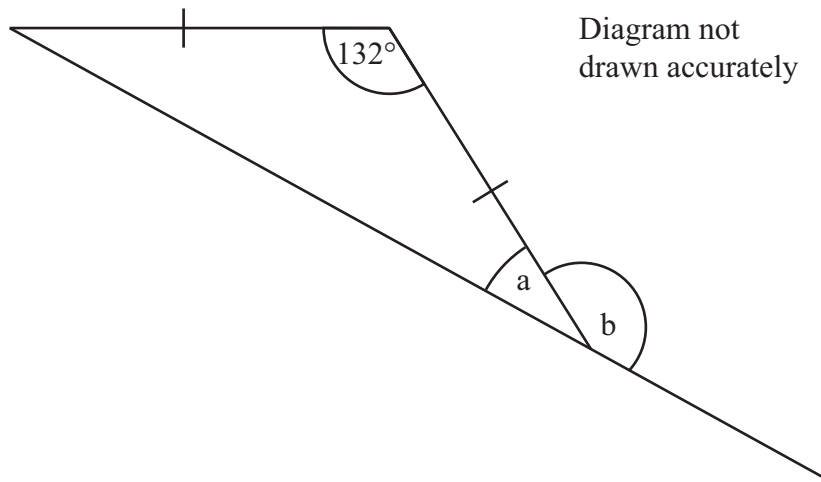
18, 17, 14, 9, \_\_\_\_\_, \_\_\_\_\_

[2]

2 Simplify  $4a + 3b - a - 5b$

Answer \_\_\_\_\_ [2]

3



Find the size of

(a) angle a

Answer a = \_\_\_\_\_° [2]

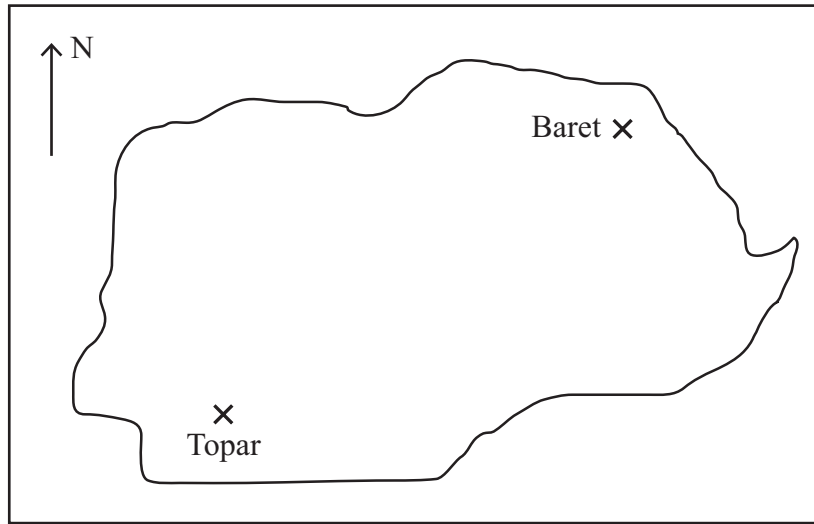
(b) angle b

Answer b = \_\_\_\_\_° [1]

[Turn over



4



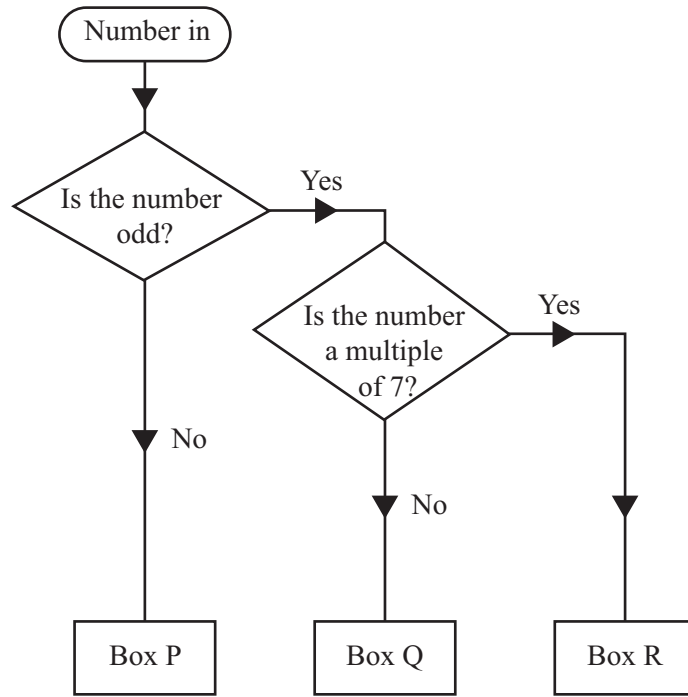
In the map above the scale is 1 cm = 60 km

Find the actual distance between Baret and Topar.

Answer \_\_\_\_\_ km [3]



5



Using the decision tree diagram, name the box for

(a) 25 Answer Box \_\_\_\_\_

(b) 22 Answer Box \_\_\_\_\_

(c) 21 Answer Box \_\_\_\_\_ [2]

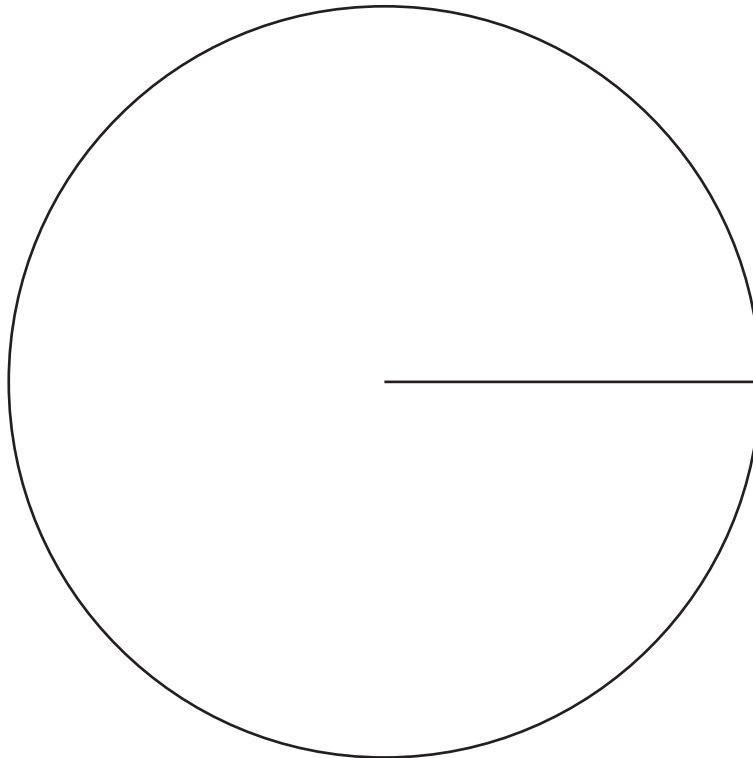
[Turn over



6 The amount of fruit sold in a canteen was recorded as follows.

Fruit	Frequency	Angle
Oranges	30	
Apples	42	
Pears	23	
Bananas	25	

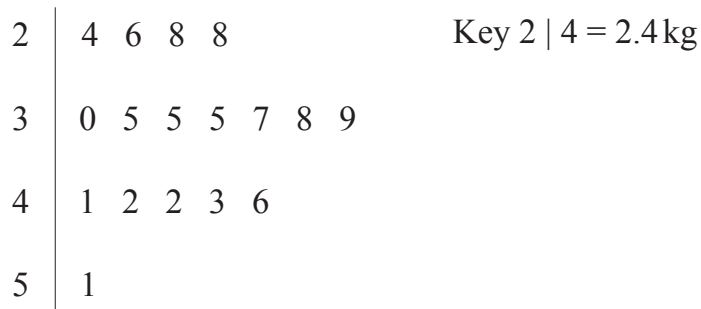
Draw a pie chart to illustrate this information.



[4]



7 The stem and leaf diagram shows the weights of some babies.



(a) Find

(i) the range,

Answer \_\_\_\_\_ kg [1]

(ii) the mode,

Answer \_\_\_\_\_ kg [1]

(iii) the median.

Answer \_\_\_\_\_ kg [1]

(b) A mistake was made. The weight of 4.6 kg should have been 4.5 kg.  
Which of the following will change?  
Circle the correct answer.

range      median      mean      mode

[1]

[Turn over



- 8 Write  $\frac{3}{8}$ , 0.4 and 35% in ascending order of size.  
Show your working.

Answer \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ [3]

**Quality of written communication will be assessed in this question.**

- 9 Tom works 30 hours each week.  
He earns £9.50 per hour.  
He saves one-fifth of his earnings each week.  
He wants to buy a guitar costing £840  
How many weeks does it take Tom to save enough to buy the guitar?  
**You must show all your working.**

Answer \_\_\_\_\_ weeks [5]







10 The total cost of 4 kg of pears and 3 kg of bananas is £14.55  
Pears cost £2.55 per kg.  
Work out the cost of 1 kg of bananas.

Answer £ \_\_\_\_\_ [4]



- 11 A company makes 500 rag dolls.  
It costs £3.14 to make each rag doll.  
25% of the rag dolls are given to a local charity.  
Of the rest, four-fifths are sold for the full price of £5  
The remainder are then sold at half-price.  
How much profit does the company make?

Answer £ \_\_\_\_\_ [6]





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**(Questions continue overleaf)**



- 12 A salesman recorded the average temperature ( $^{\circ}\text{C}$ ) and his cold drink sales (£) during 8 weeks of the summer.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Average Temperature ( $^{\circ}\text{C}$ )	12	14	18	13	16	15	14	18
Sales (£)	204	268	392	236	328	298	282	380

The first three points have already been plotted.

- (a) Use the data to complete the scatter graph. [2]

- (b) Draw the line of best fit. [1]

- (c) In week 9 the average temperature was  $17^{\circ}\text{C}$ .

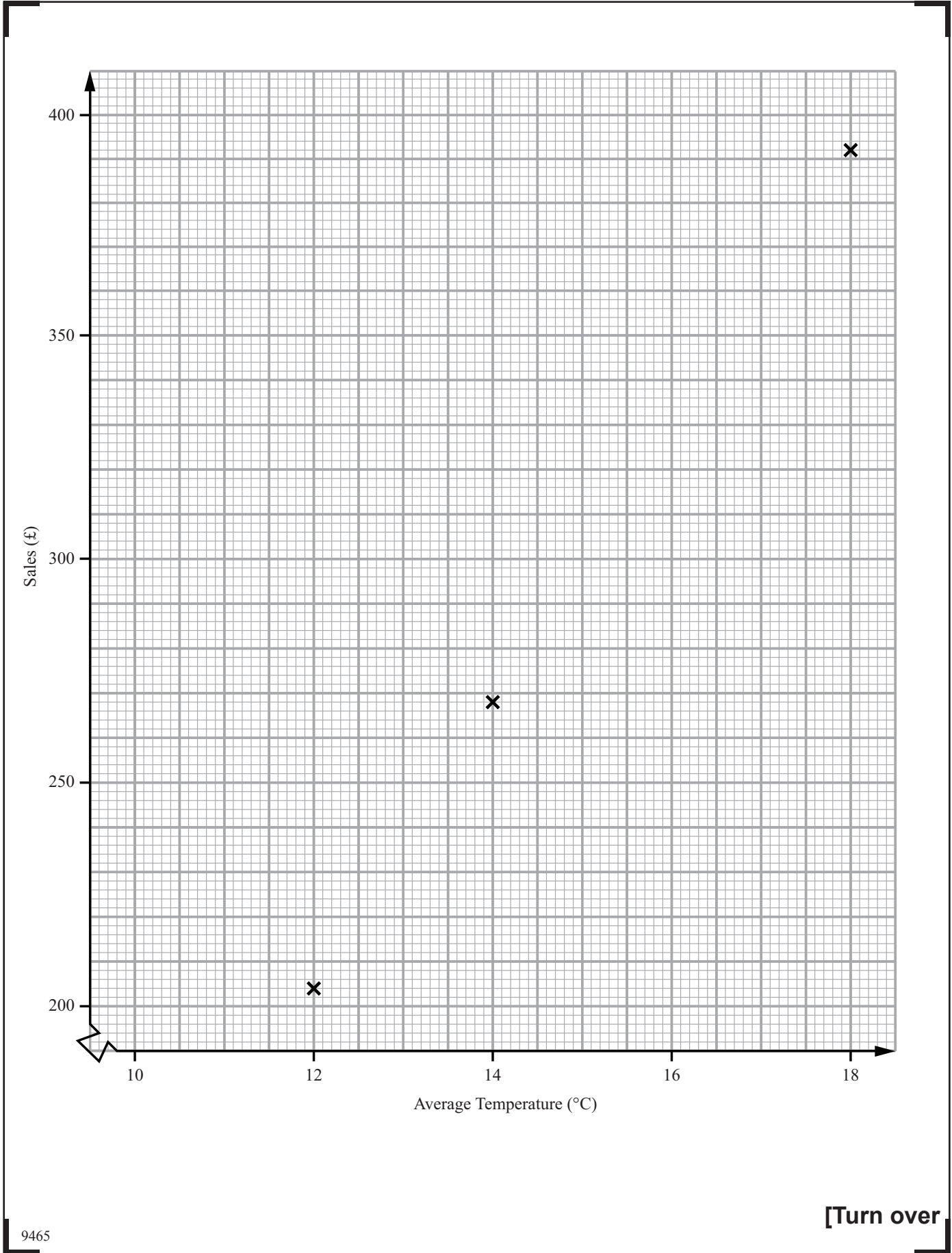
Estimate the sales for week 9

Answer £ \_\_\_\_\_ [1]

- (d) What type of correlation does your graph show?

Answer \_\_\_\_\_ [1]





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[Turn over



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**Quality of written communication will be assessed in this question.**

**13** Jean and Joyce are both pupils at Eastwood Girls High School and they want to know how many times a month, on average, the people in their town go to church.

**(a)** Jean asks 300 pupils in her school.

Give **two** reasons why Jean's sample may not be representative of the people in her town.

Reason 1 \_\_\_\_\_  
\_\_\_\_\_ [1]

Reason 2 \_\_\_\_\_  
\_\_\_\_\_ [1]

**(b)** Joyce stands outside her local church and asks 300 people on their way in to church.

Give **one** reason why Joyce's sample is biased.

Reason \_\_\_\_\_  
\_\_\_\_\_ [1]

**14** An airport had 123 planes departing one day.  
46 of these planes departed late.  
What percentage were late?  
Give your answer correct to one decimal place.

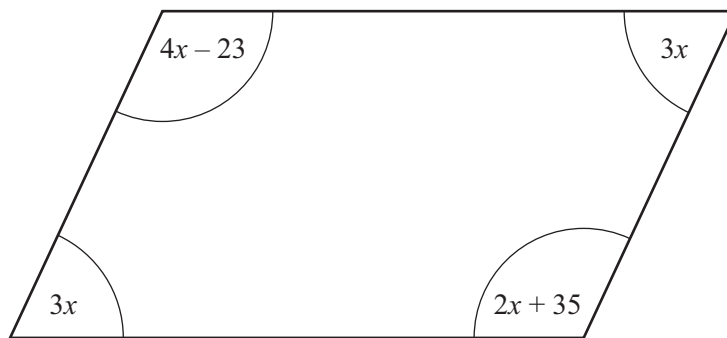
Answer \_\_\_\_\_ % [3]



15 Grapefruit cost  $g$  pence each.  
Mangoes cost  $m$  pence each.  
Sarah buys 3 grapefruit and 4 mangoes.  
The total cost is £5  
Write down an equation containing  $g$  and  $m$ .

Answer \_\_\_\_\_ [3]

16



The diagram above is a parallelogram.  
The sizes of the angles in degrees are  $3x$ ,  $4x - 23$ ,  $3x$  and  $2x + 35$   
Work out the value of  $x$ .

Answer  $x =$  \_\_\_\_\_ [3]

[Turn over



17 The price of a coat in a shop is £129

Pat has £100 but he has also a discount card which allows him 20% off the shop price. Does he have enough money to buy the coat using his discount card?

**You must show working to explain your answer.**

[3]

18  $a$  and  $b$  are different prime numbers less than 20

(a) Find a value for  $a$  and a value for  $b$  so that  $a + b$  is a square number.

Answer  $a =$  \_\_\_\_\_ ,  $b =$  \_\_\_\_\_ [2]

(b) Find a value for  $a$  and a value for  $b$  so that  $a + b$  is a **different** square number.

Answer  $a =$  \_\_\_\_\_ ,  $b =$  \_\_\_\_\_ [2]





19 A regular polygon has an interior angle of  $150^\circ$

(a) How many sides does it have?

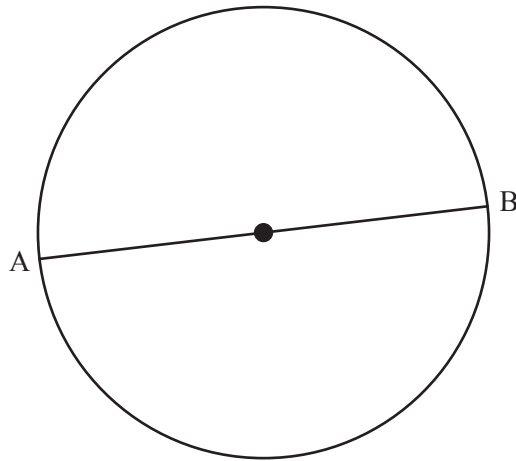
Answer \_\_\_\_\_ [2]

Two of these polygons are placed edge to edge.

(b) What regular shape would fit exactly in the space beside these touching edges?

Answer \_\_\_\_\_ [2]



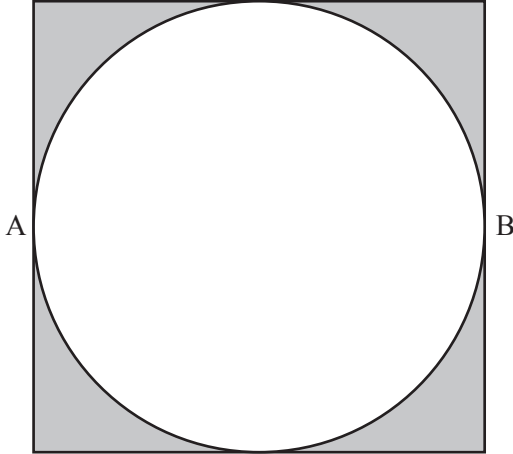


- (a) AB is a diameter of the circle. AB is 13 cm.

Calculate the area of the circle.

Answer \_\_\_\_\_ [3]

- (b) This circle is now set inside a square as shown. Find the shaded area.



Answer \_\_\_\_\_ [2]



21 Solve the equation  $\frac{4y}{5} - 3 = 9$

Answer  $y =$  \_\_\_\_\_ [3]

22 Five years ago 123 million CDs were sold in the UK.  
69.4 million were sold last year.  
Work out the percentage fall in sales of CDs.

Answer \_\_\_\_\_ % [3]



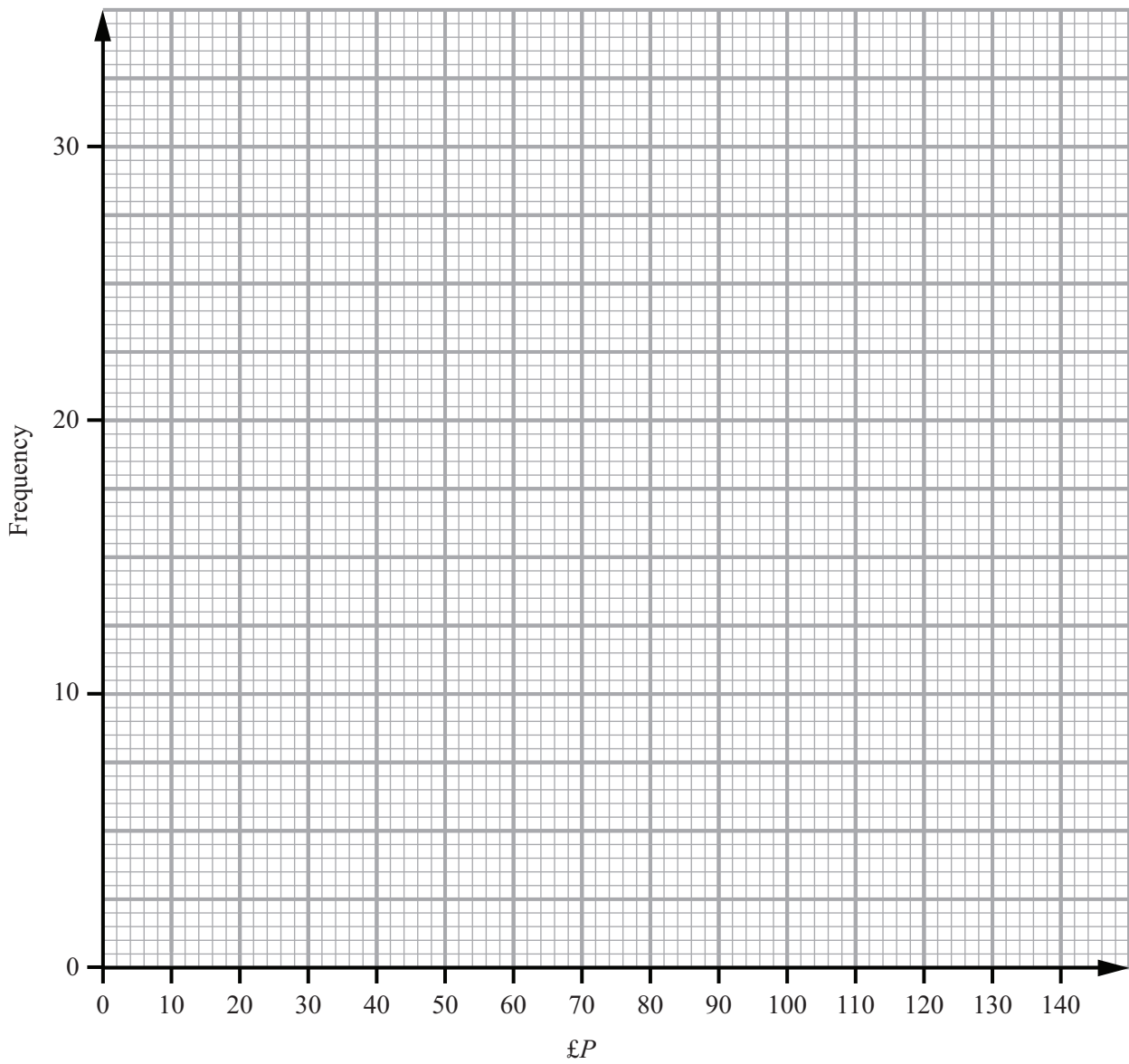
23 100 shoppers were asked how much they spent on food in one week.

Amount spent (£ $P$ )	Frequency
$20 < P \leq 40$	8
$40 < P \leq 60$	30
$60 < P \leq 80$	28
$80 < P \leq 100$	27
$100 < P \leq 120$	5
$120 < P \leq 140$	2



(a) Draw a frequency polygon to show this information.

[2]

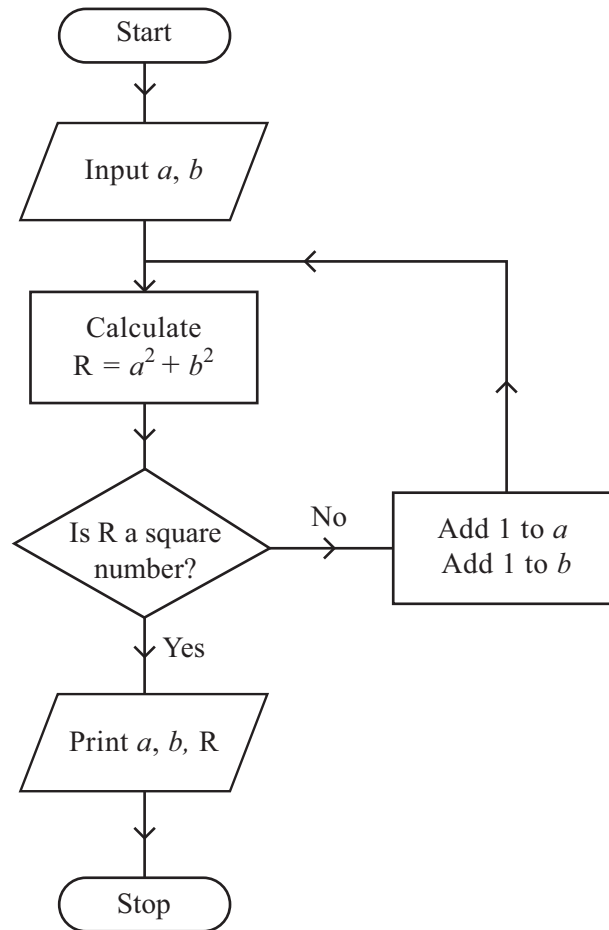


(b) Which class interval contains the median?

Answer \_\_\_\_\_ [1]

[Turn over





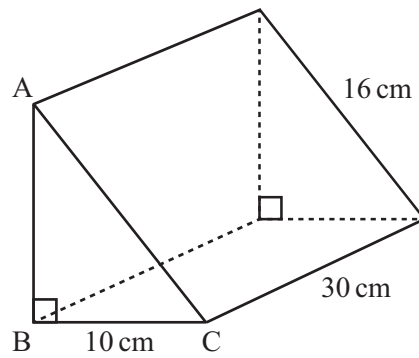
Starting with  $a = 6, b = 13$  use the flow chart to find the values printed.

$a$	$b$	R
6	13	

Answer  $a = \underline{\hspace{2cm}}$ ,  $b = \underline{\hspace{2cm}}$ ,  $R = \underline{\hspace{2cm}}$  [3]



25 In the triangular prism ABC is a right-angled triangle.



(a) Calculate the length of AB.

Answer \_\_\_\_\_ cm [3]

(b) Calculate the volume of the prism.

Answer \_\_\_\_\_ cm<sup>3</sup> [3]

[Turn over



- 26 The equation  $x^3 + 4x^2 = 100$  has a solution between 1 and 5  
Use a trial and improvement method to find this solution.  
Give your answer correct to one decimal place.  
You must show all your working.

Answer  $x =$  \_\_\_\_\_ [4]





27 John thinks of a number.  
He multiplies it by 9 and subtracts 4  
The answer is three times the number he started with.  
Work out the starting number.

Answer \_\_\_\_\_ [2]



28 (a) (i) Write 30 as a product of prime factors.

Answer 30 = \_\_\_\_\_ [1]

(ii) Write 22 as a product of prime factors.

Answer 22 = \_\_\_\_\_ [1]

- (b) An airport bus leaves the city hall every 30 minutes.  
A shuttle bus leaves the city hall every 22 minutes.  
An airport bus and a shuttle bus both leave the city hall at 8.00 am.  
At what time will an airport bus and a shuttle bus next leave the city hall at the same time?

Answer \_\_\_\_\_ [3]

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<b>Total Marks</b>	
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Examiner Number

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