



General Certificate of Secondary Education
2016

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

Mathematics

Unit T2
(With calculator)

Foundation Tier



[GMT21]

GMT21

THURSDAY 26 MAY, 9.15am–10.45am

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 13 and 23**.

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

The Formula Sheet is on page 2.

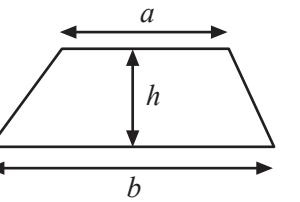
9986



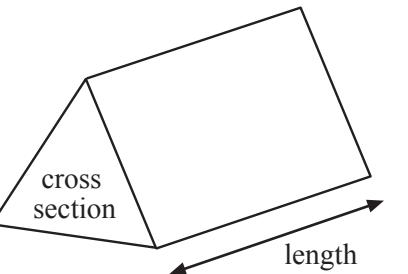
28GMT2101

Formula Sheet

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



Volume of prism = area of cross section \times length



BLANK PAGE

DO NOT WRITE ON THIS PAGE

(Questions start overleaf)

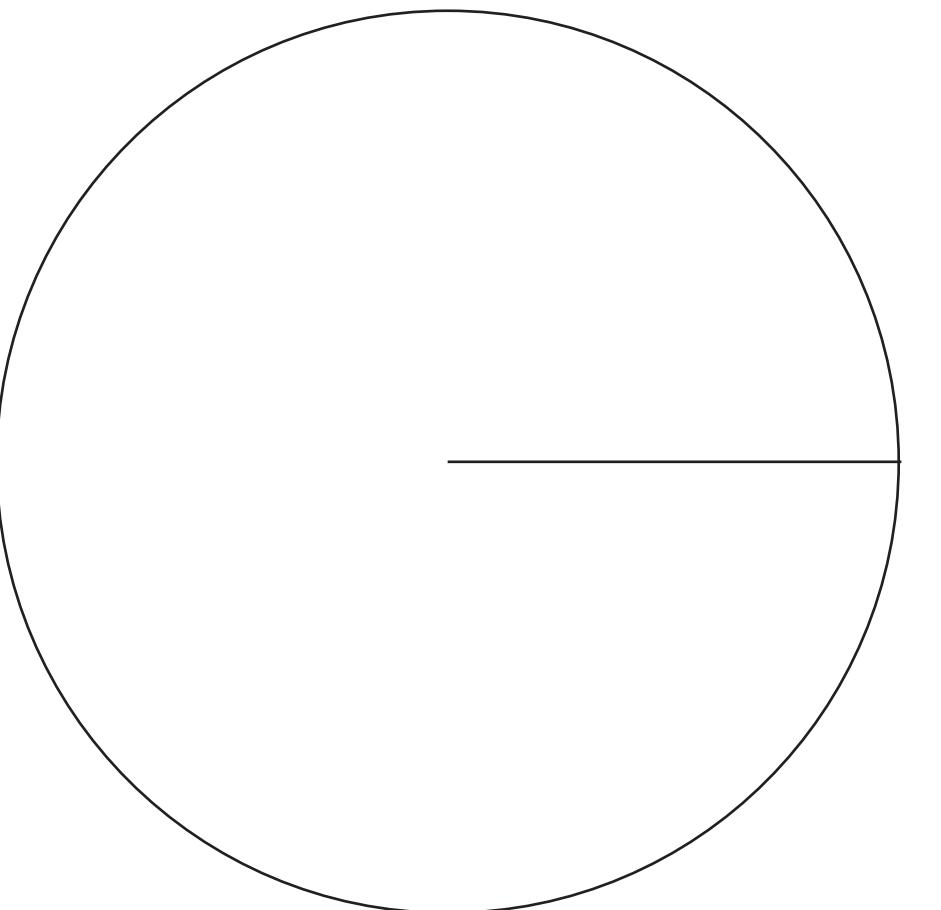
[Turn over



1 The number of dogs in an animal shelter was recorded.

Breed of dog	Frequency	Angle
Terrier	12	
Collie	9	
Labrador	14	
Alsatian	5	

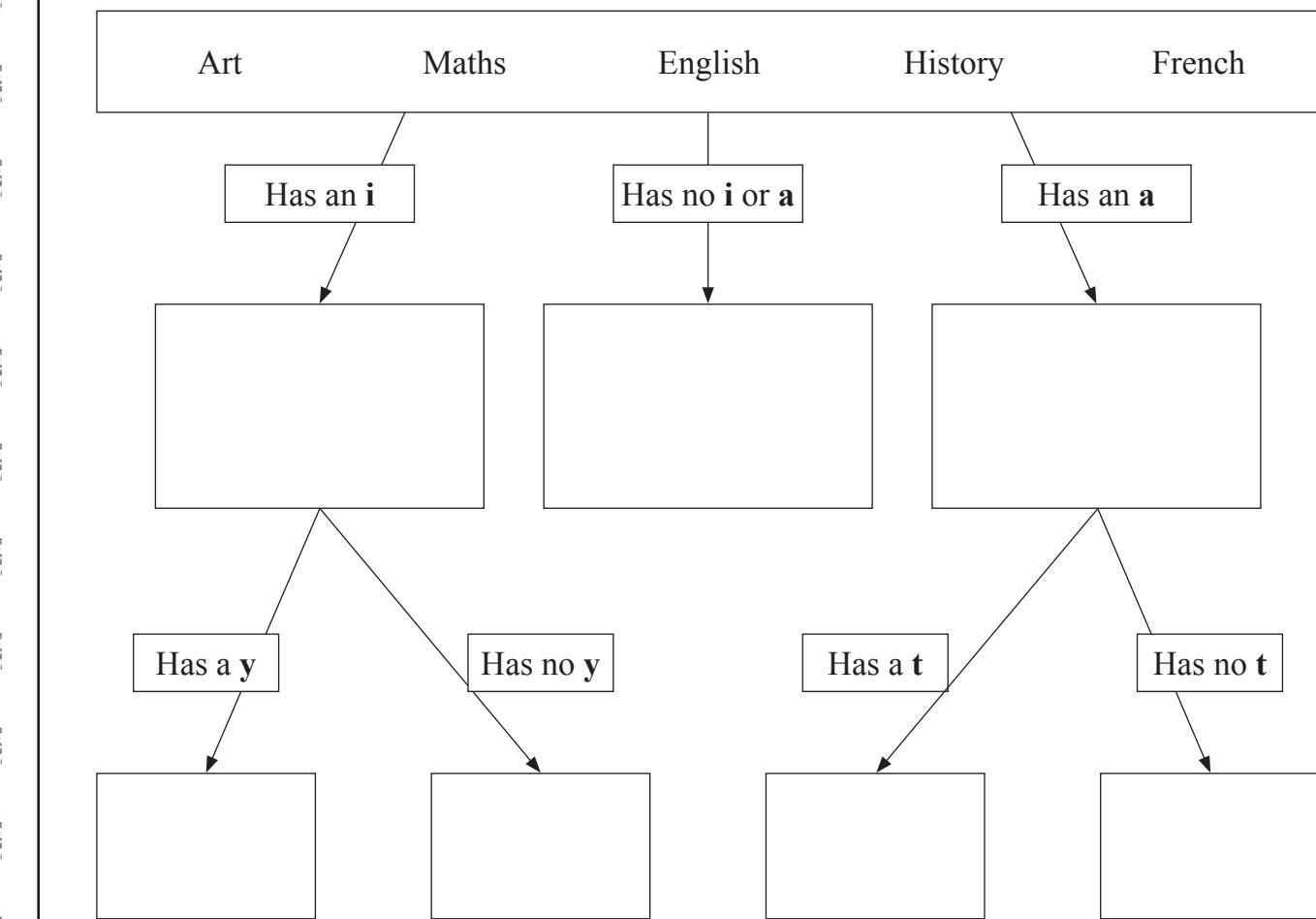
Draw a pie chart to show this information.



[4]



2 Use the decision tree diagram to place all the words in their correct boxes.

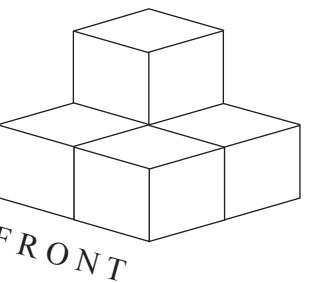


[2]

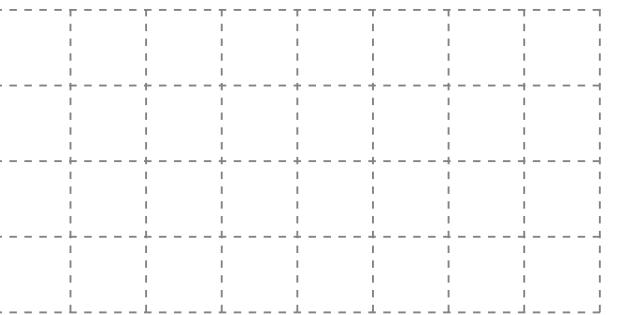
[Turn over]



3 The diagram below shows a 3-dimensional shape.

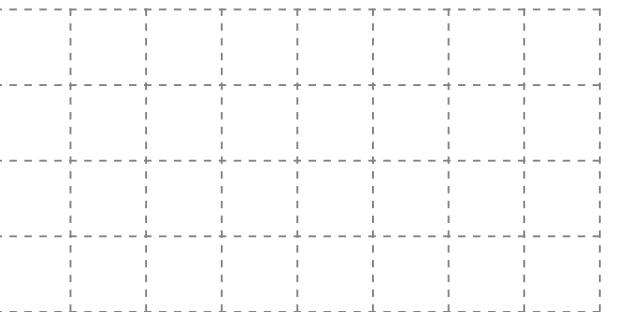


(a) On the square grid, draw the plan for the shape.



[1]

(b) On the square grid below, draw the front elevation of the shape.



[2]



4

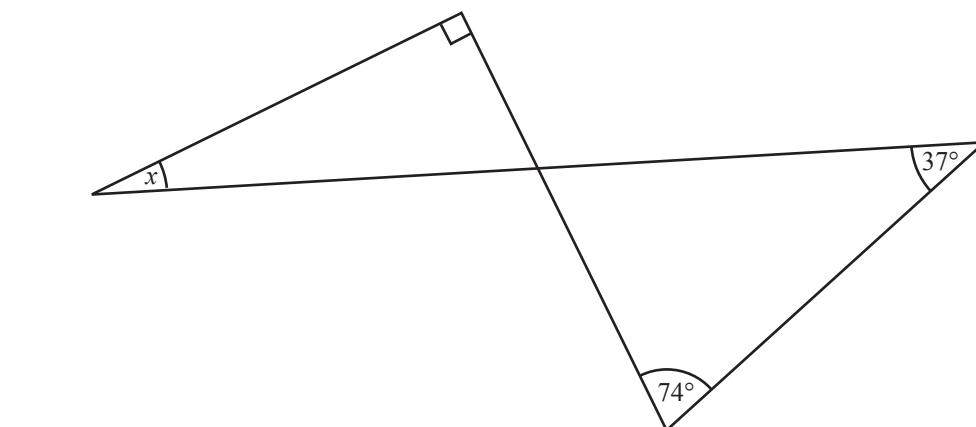


diagram not drawn accurately

Calculate the size of the angle marked x .

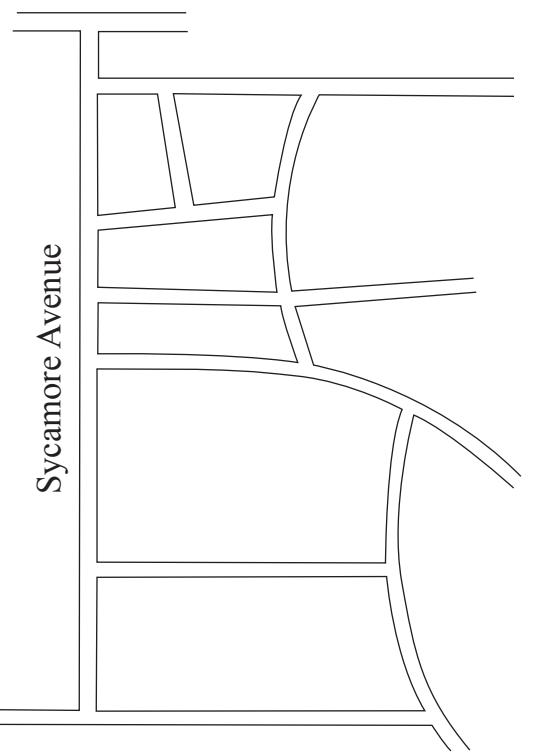
Answer _____ $^{\circ}$ [3]

9986

[Turn over



5 Below is a street map showing Sycamore Avenue.



The actual length of Sycamore Avenue is 180 m.

Work out the scale of the map as a ratio in the form 1 : _____

Answer 1 : _____ [3]



6 (a) Fill in the boxes to complete this sequence.

19, 18, 15, 10, ,

[2]

(b) Solve $7 + 2x = 13$

Answer $x =$ _____ [2]

(c) Expand $3(5 - y)$

Answer _____ [2]

(d) Calculate the cube of 11

Answer _____ [1]

(e) Work out the value of $4c + 2d$ when $c = -3$ and $d = 5$

Answer _____ [2]

[Turn over]



7 In High Grade College there are 800 students.

35% of the students have blond hair.

15% of the students with blond hair wear glasses.

How many students with blond hair wear glasses?

Answer _____ [3]

8 Carrots come in bags with either 7 or 8 carrots in them.

83 carrots are packed into bags.

How many bags have 8 carrots in them?

Answer _____ [3]



9 (a) What fraction is halfway between $\frac{1}{4}$ and $\frac{3}{8}$?

Answer _____ [2]

(b) Work out the value of $0.7^2 + \sqrt{2.25}$

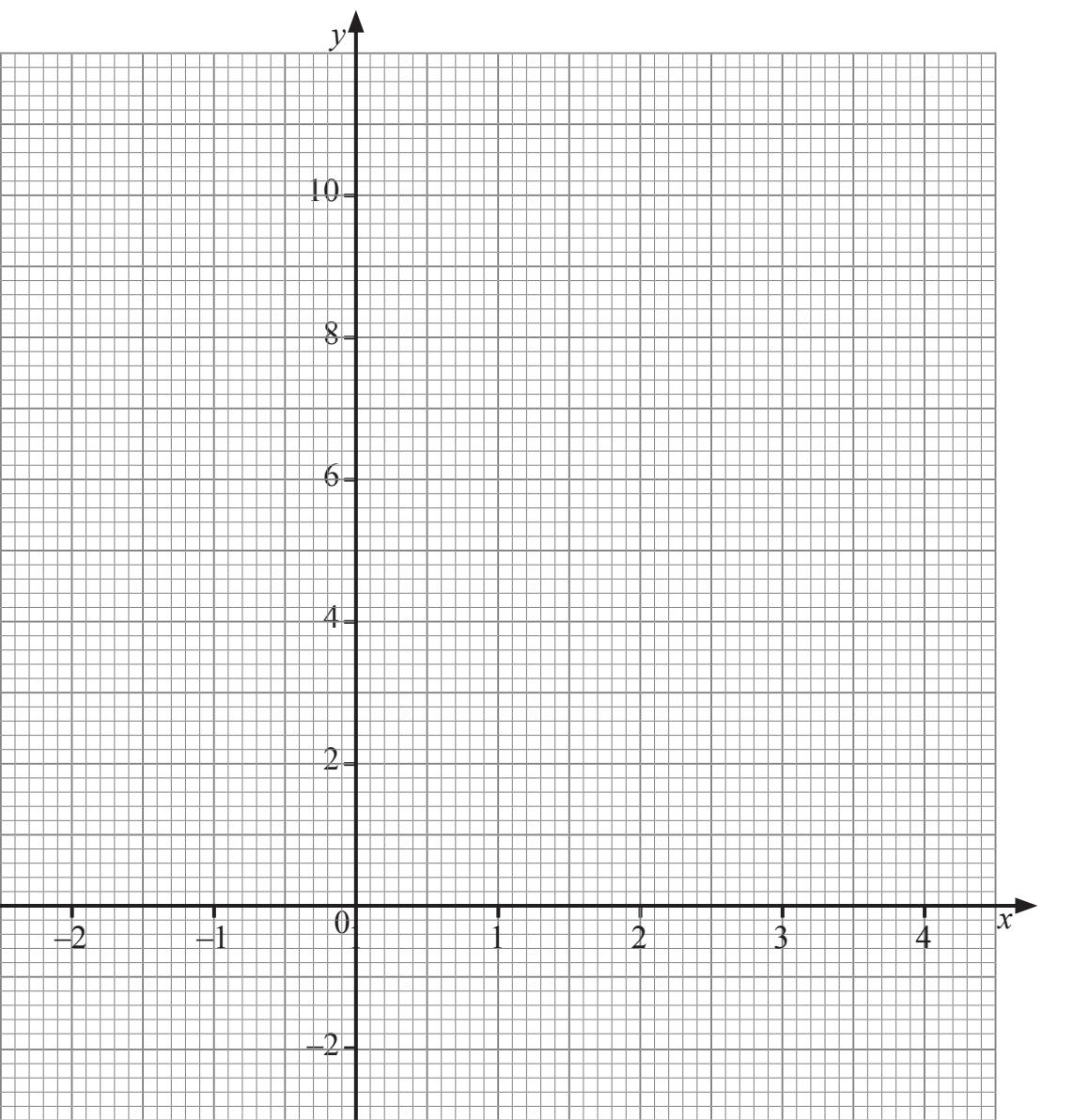
Answer _____ [1]

[Turn over]



10 (a) Complete the following table and then draw the graph of $y = 7 - 3x$

x	-1	1	3
$y = 7 - 3x$	10		



[3]

(b) The line $y = 7 - 3x$ crosses the line $y = 1$ at P.

Find the coordinates of the point P.

Answer P (_____, _____) [2]



11 The lengths of twigs measured to the nearest tenth of a centimetre are given below.

4.3 4.7 2.9 1.0 5.8

4.2 3.6 1.9 2.7 3.0

2.6 3.7 4.3 2.7 2.8

(a) Draw a stem and leaf diagram to show this data.

[3]

(b) Find the range of the lengths.

Answer _____ cm [1]

(c) Find the median of the lengths.

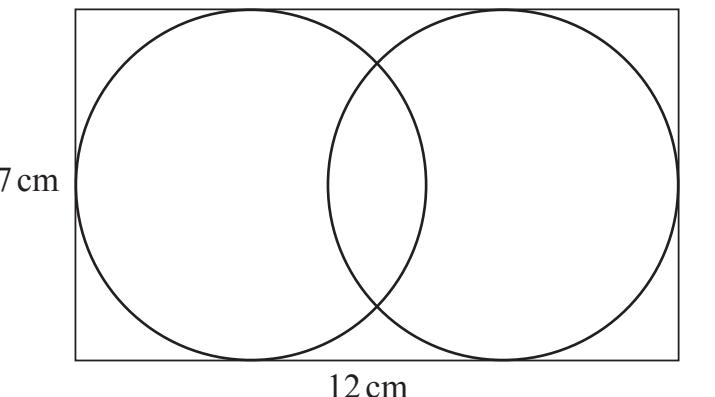
Answer _____ cm [1]

[Turn over]



12 The diagram shows two congruent circles inside a rectangle.

The rectangle measures 12 cm by 7 cm.



Calculate the distance between the centres of the two circles.

Answer _____ cm [2]



Quality of written communication will be assessed in this question.

13 Larry and Jake each measure the length of a different slug. They both say that their slug is 6 cm to the nearest centimetre. Does this mean that both slugs are exactly the same length?

Explain your answer clearly.

[2]

14 The number of days absent in a term was recorded for a class.

Number of days absent	Frequency
0	12
1	8
2	6
3	7
4	2
5	1

Calculate the mean number of days absent.

Answer _____ [3]

[Turn over

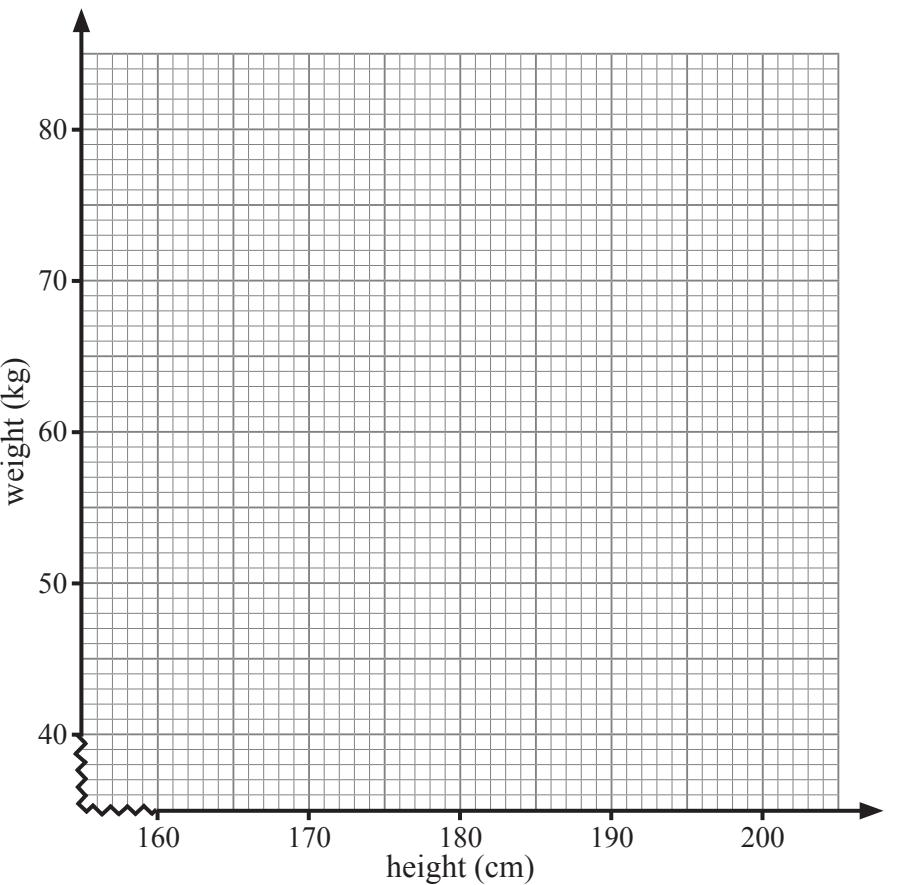


15 The heights and weights of 7 people are given.

height (cm)	165	197	178	168	180	174	190
weight (kg)	45	77	58	50	65	60	63

(a) Using the grid below show this information on a scatter diagram.

Mark your points clearly.



[2]

(b) Draw a line of best fit on the scatter diagram.

[1]

(c) Use your line of best fit to estimate the weight of a person whose height is 185 cm.

Answer _____ kg [1]



16 Last week a dentist noted that, of all her treatments,

$\frac{1}{3}$ were fillings, $\frac{1}{4}$ were extractions, $\frac{1}{8}$ were denture treatment and the rest were cleaning.

What fraction were cleaning?

Answer _____ [2]

17 (a) Jenna writes down all the whole numbers from 1 to 15

What percentage of these numbers are prime numbers?

Answer _____ % [2]

(b) Sam buys apples at £5 per dozen (12) and sells them at 55p each.

What is his percentage profit?

Answer _____ % [3]

[Turn over]



18 A sheet of paper is 300 mm long and 210 mm wide.

Find in its simplest form the ratio of the length of the sheet to the width of the sheet.

Answer _____ [2]

19 (a) Factorise

(i) $6a + 15$

Answer _____ [1]

(ii) $4x - x^2$

Answer _____ [1]

(b) Solve $6x - 7 = 14 - x$

Answer $x =$ _____ [3]

20 Calculate the perimeter of a semicircle of diameter 14 cm.

Answer _____ cm [3]



BLANK PAGE

DO NOT WRITE ON THIS PAGE

(Questions continue overleaf)

[Turn over



21 The amount of pocket money (p) for each of a group of students is shown below.

Money (£)	Frequency
$0 < p \leq 3$	6
$3 < p \leq 6$	18
$6 < p \leq 9$	16
$9 < p \leq 12$	22
$12 < p \leq 15$	13
$15 < p \leq 18$	4

(a) What is the modal class?

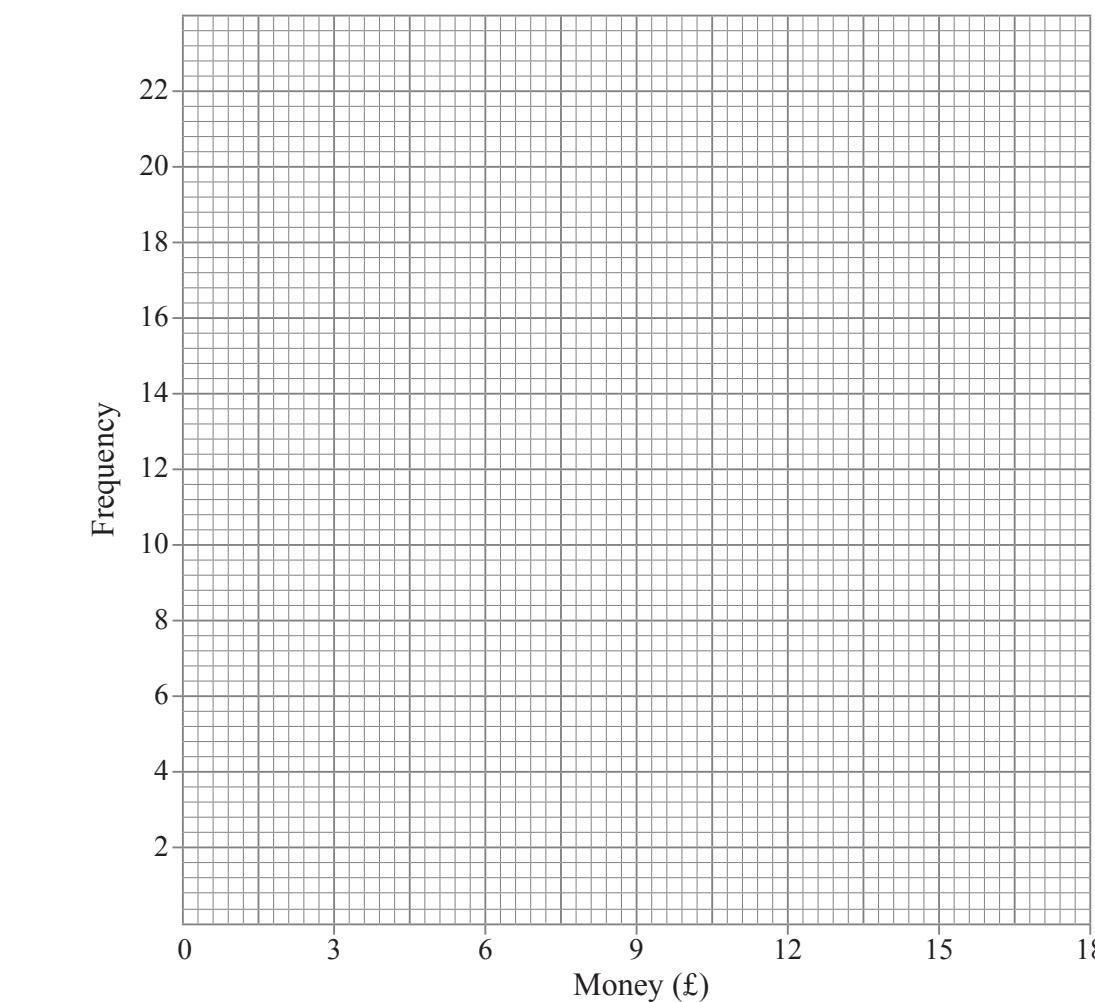
Answer _____ [1]

(b) Which class interval contains the median amount of pocket money?

Answer _____ [1]



(c) On the grid below draw a frequency polygon to show this data.



[2]

22 Two points $P(-4, -1)$ and $Q(-8, 5)$ are joined by a straight line.

Work out the coordinates of the midpoint of the line PQ .

Answer (_____, _____) [2]

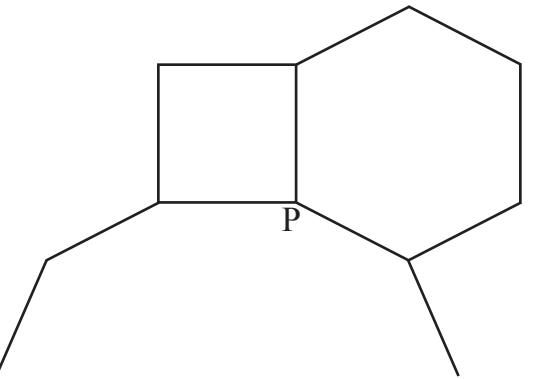
[Turn over



Quality of written communication will be assessed in this question.

23 Three regular polygons meet at point P as shown.

diagram not drawn accurately



One polygon is a square and another polygon is a regular hexagon. How many sides has the third polygon?

Explain your working clearly.

Answer _____ sides [4]



24 (a) Write 108 as a product of prime factors.

Give your answer in index notation.

Answer _____ [3]

(b) Find the LCM of 108 and 60

Answer _____ [2]

(c) Find the HCF of 108 and 60

Answer _____ [1]

[Turn over



25 (a) What is the n^{th} term for the sequence?

12, 24, 36, 48,

Answer _____ [1]

(b) What is the n^{th} term for the sequence?

13, 9, 5, 1, -3,

Answer _____ [2]

26 In a swimming club $\frac{2}{5}$ of the members are Juniors.

The remaining 90 members are Seniors.

How many members are there in the club?

Answer _____ [3]



27 (a) Expand and simplify $8(a - 2) - 3(2a - 6)$

Answer _____ [2]

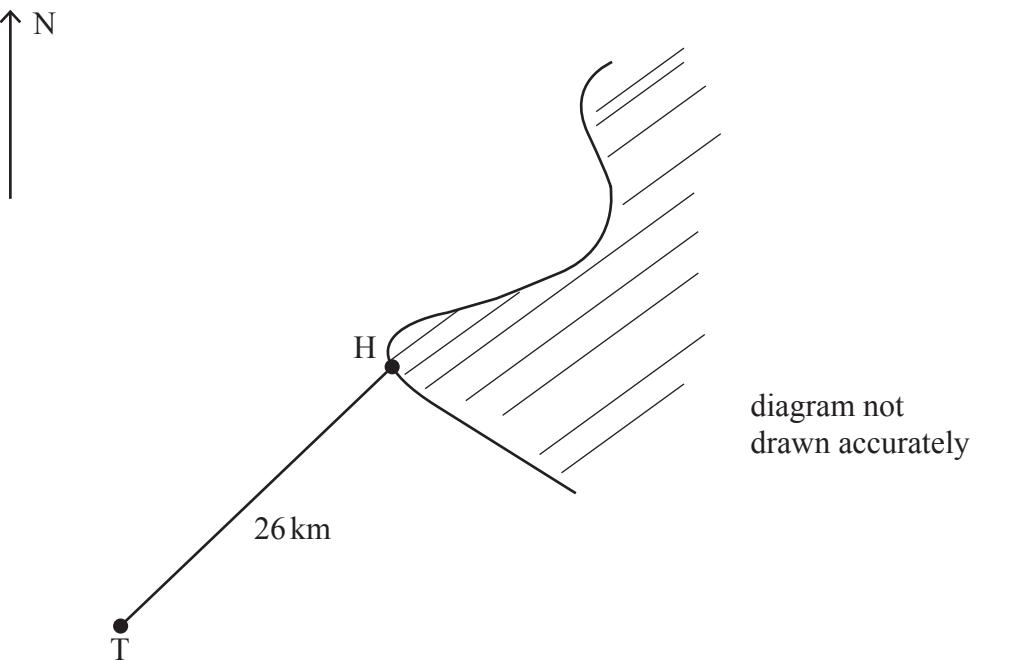
(b) Solve $\frac{2x}{3} - 7 = 5$

Answer $x =$ _____ [2]

[Turn over]



28



A trawler T has sailed 26 km from a harbour H. It is now 10 km west of the harbour.

Calculate how far south it is from the harbour.

Answer _____ km [3]

9986



28GMT2126

THIS IS THE END OF THE QUESTION PAPER

BLANK PAGE

DO NOT WRITE ON THIS PAGE



For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	

Total Marks	
-------------	--

Examiner Number

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA
will be happy to rectify any omissions of acknowledgement in future if notified.

