



Rewarding Learning

Centre Number

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Candidate Number

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General Certificate of Secondary Education
2013

Mathematics

Unit T2

(With calculator)

Foundation Tier



[GMT21]

GMT21

TUESDAY 11 JUNE, 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 box, around 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-seven** 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 26**.

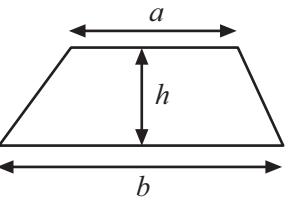
You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

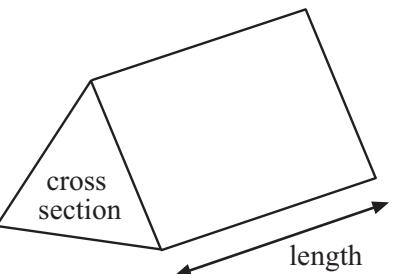


Formula Sheet

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



Volume of prism = area of cross section \times length

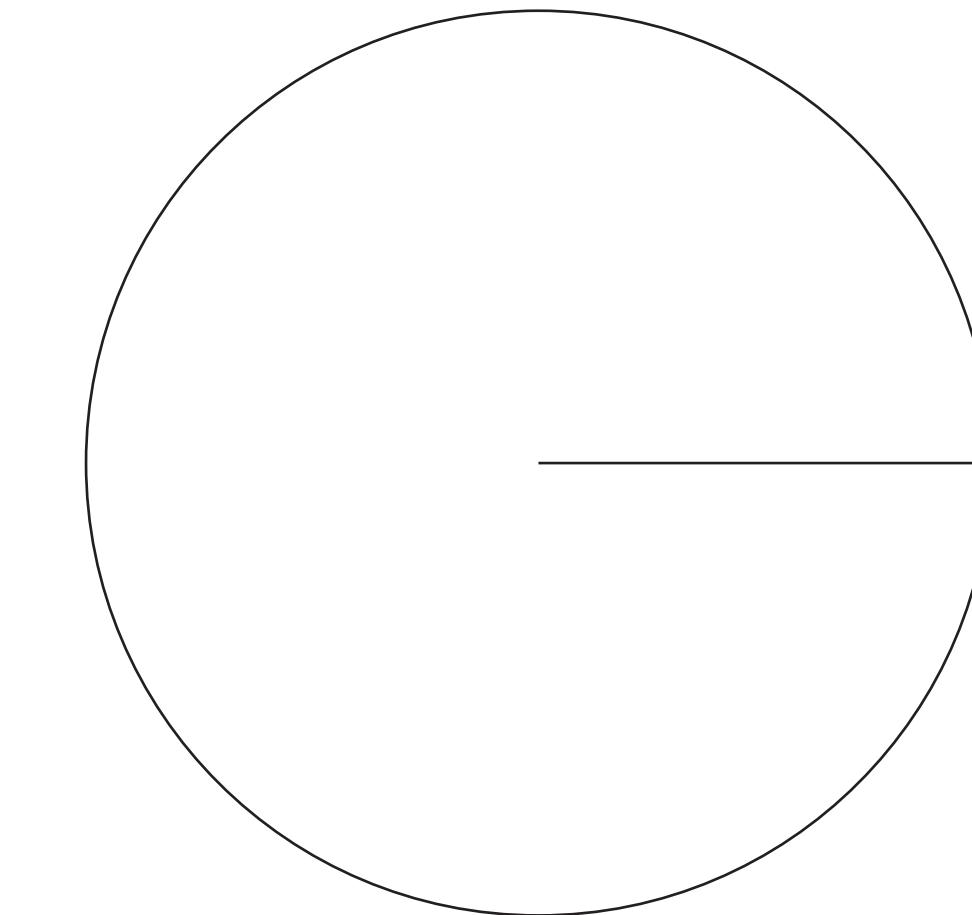


1 The number of crisps sold in a tuck shop was recorded as follows.

Examiner Only	
Marks	Remark

Flavour	Frequency	Angle
Salt and Vinegar	10	
Ready Salted	8	
Smokey Bacon	17	
Cheese and Onion	25	

Draw a pie chart to illustrate this information.



[4]

Total Question 1

[Turn over



2 Calculate $\frac{2}{0.5^2}$

Examiner Only	
Marks	Remark
Total Question 2	

Answer _____ [2]



3 (a) Name each of the 3D shapes from the given descriptions.

(i) I have 12 edges. I have 8 vertices.

My faces are not all the same. My faces are all rectangles.

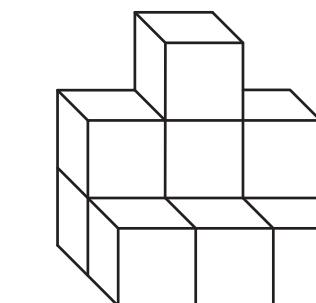
Answer _____ [1]

(ii) I have 9 edges. I have 6 vertices.

I have two triangular faces and three rectangular faces.

Answer _____ [1]

(b) This solid is made up of centimetre cubes.



On the grid below draw the front elevation of the solid.



[2]

Total Question 3

[Turn over



4 (a) Simplify $7a - 3b - 2a + 6b$

Examiner Only

Marks

Remark

Answer _____ [2]

(b) Find the value of $5x + 2y$ when $x = 2$ and $y = -6$

Answer _____ [2]

Total Question 4



5 (a) Complete the table for $y = 6 - 2x$

x	-1	0	1	2	3
$y = 6 - 2x$	8	4	0		

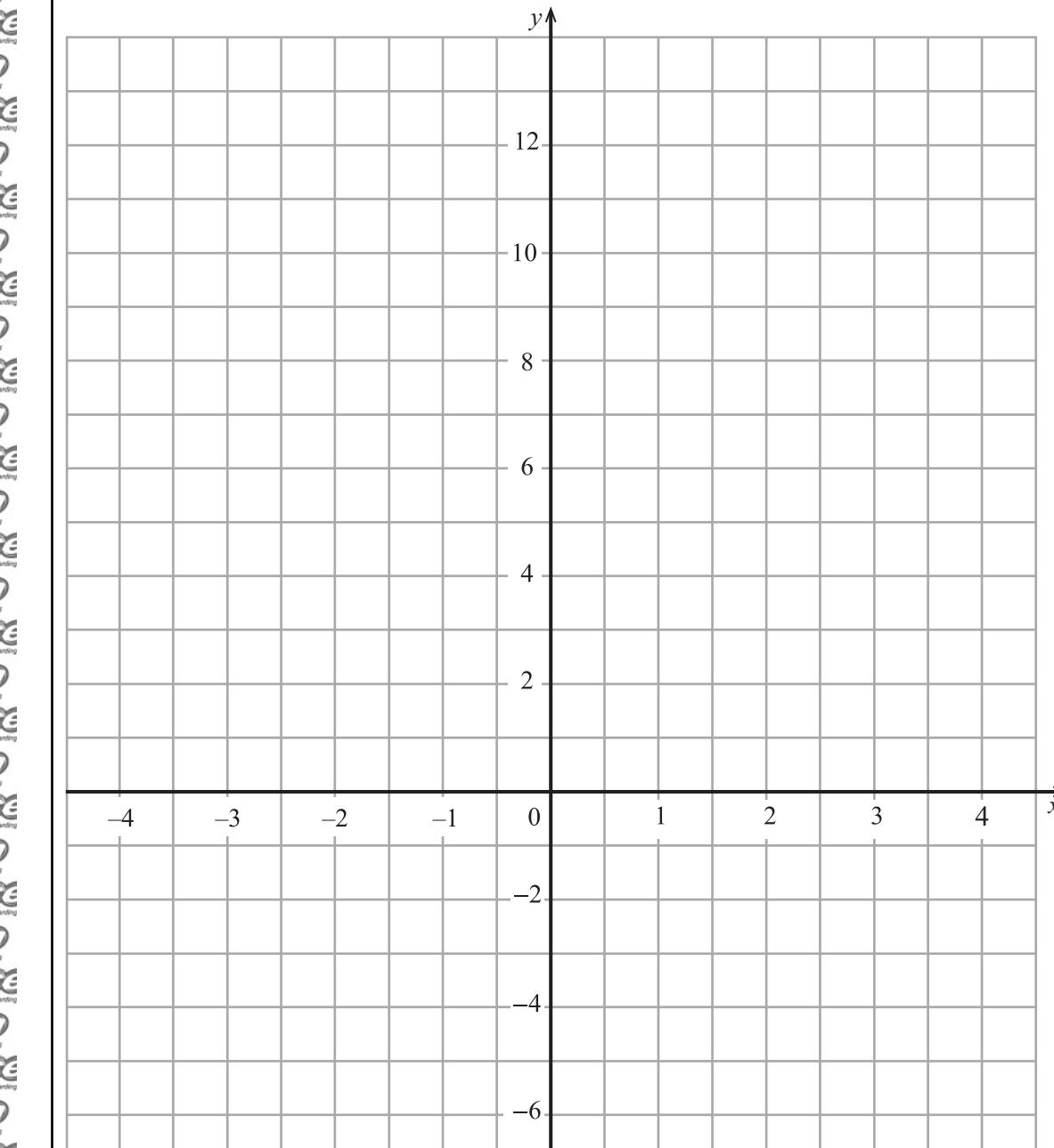
[2]

Examiner Only

Marks

Remark

(b) Using values from the table, draw the graph of $y = 6 - 2x$



[2]

Total Question 5

[Turn over



6 (a) Which of the following fractions is nearest in size to $\frac{1}{4}$?

$$\frac{6}{25}$$

$$\frac{13}{50}$$

$$\frac{49}{200}$$

$$\frac{97}{400}$$

Show your work.

Answer _____ [2]

(b) Work out the answer to the following, without using a calculator.

Show your work.

$$\frac{7}{12} - \frac{1}{6}$$

[2]

Total Question 6



7 Construct a triangle ABC where AB is 8 cm, AC is 5 cm and angle A is 55°

Examiner Only

Marks

Remark

A
X

[2]

Total Question 7

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[Turn over



8

**Timetable: Enniskillen Bus Centre – Omagh Bus Centre
Service 94 (Monday–Friday)**

Calling points:

Enniskillen, Bus Centre	...	0655	0735	0740	0905	1130	1330	1545
Mullaghmeen, Village	...	...	...	...	...	...	...	...
Ballinamallard, Church	...	0710	...	0755	0920	...	1345	1605
Trillick, Warnock's Shop	...	0720	0802	0805	0930	...	1355	1615
Irvinstown, Bypass	...	...	...	...	...	1200	...	...
Dromore (Tyrone), Bypass	0727	0730	...	0815	0940	1220	1405	1625
Prices Shop, near Dromore	...	0738	...	0823	0948	1225	1413	1633
Omagh, Bus Centre	0752	0752	...	0850	1005	1240	1430	1655

(a) The 0740 bus from Enniskillen is running 8 minutes late.
At what time will it arrive in Ballinamallard?

Examiner Only	
Marks	Remark

Answer _____ [1]

(b) A girl needs to be in Omagh for an appointment at 1.15 pm. She leaves Enniskillen on the latest possible bus to be in time for her appointment. How long will she have to spend in Omagh before the appointment?

Total Question 8

Answer _____ minutes [2]



Quality of written communication will be assessed in this question

Examiner Only	
Marks	Remark
Total Question 9	

9 The boys in Class 12A scored the following goals in a penalty competition

$$6, \quad 10, \quad 9, \quad 8, \quad 7, \quad 6, \quad 7, \quad 10, \quad 9,$$

The 8 boys in Class 12B scored a total of 72 goals.

Which class did better in the competition?

Explain your ans

Answer

because _____

Total Question 9

10 In a greengrocer's, cooking apples cost £2.65 per kg

Mary buys 0.6 kg of cooking apples.

She also buys 0.4 kg of tomato.

At the checkout her bill for both items comes to £2.

Work out the price per kg for the tomatoes.

Total Question 10

Answer £ _____ [4]

[Turn over]



11



Examiner Only

Marks

Remark

Bag 1 contains m marbles.

Bag 2 contains 5 less marbles than Bag 1

(a) Write down an expression in terms of m for the number of marbles in Bag 2

Answer _____ [1]

Bag 3 contains twice as many as in Bag 1 **plus** the number of marbles that are in Bag 2

(b) Write down an expression in terms of m for the number of marbles in Bag 3

Give your answer in its simplest form.

Answer _____ [2]

The total number of marbles in Bag 3 is 22

(c) Set up and solve an equation to help find how many marbles are in Bag 2

Total Question 11

Answer In Bag 2 there are _____ marbles [3]



12 (a) Fill in the boxes to show the next 2 terms in the sequence

16, 11, 6, ,

[2]

Examiner Only

Marks	Remark
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(b) The n^{th} term in a sequence is given as

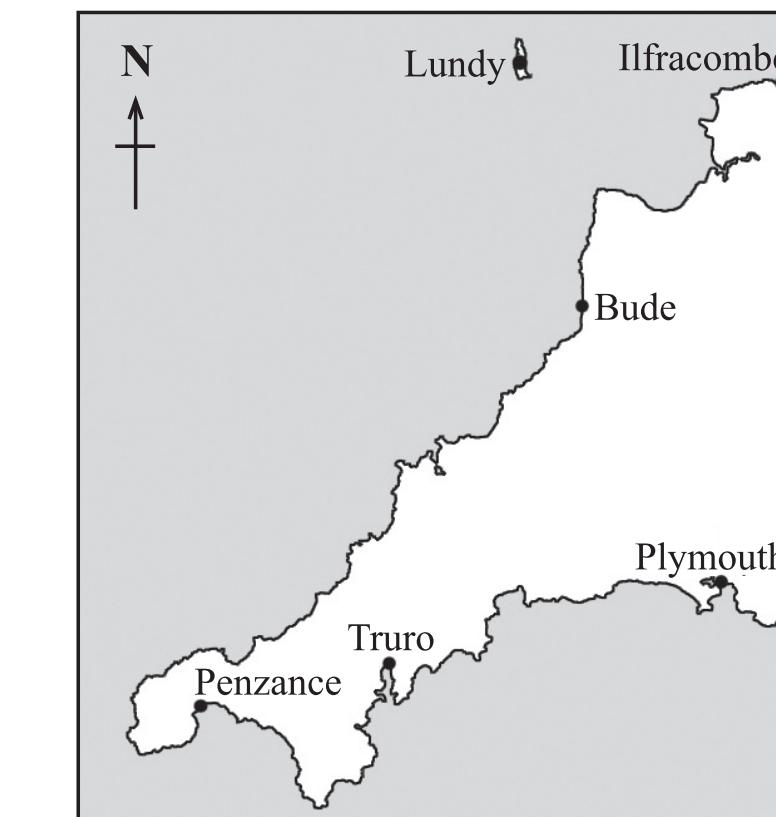
$$2n + \boxed{\quad}$$

The 3rd term is 10. What value is missing from the box?

Answer _____ [2]

Total Question 12

13



© Graded examples in Mathematics: Geometry & Trigonometry, by M R Heylings, page 24,
published by Schofield & Sims, 1984. ISBN 0721722314

Boscastle is on a bearing of 028° from Truro.

Boscastle is on a bearing of 310° from Plymouth.

Locate the position of Boscastle on the map above. Indicate Boscastle with a point marked B.

[3]

Total Question 13

[Turn over



14 (a) Show how to work out the answer to the following without using a calculator.

$$\frac{3}{8} \div \frac{3}{4}$$

Examiner Only	
Marks	Remark
Total Question 14	

[2]

(b) What percentage is £24 of £320?

Answer _____ % [2]

15 The correlation in a scatter graph may be described as one of the following:

no correlation positive correlation negative correlation

Write down the type of correlation you would expect to find in scatter graphs which show the following information:

(a) average daily temperature and cold drinks sales,

Answer _____ [1]

(b) marks in a test and distance travelled to school,

Answer _____ [1]

(c) number in family and average weekly amount spent on food,

Answer _____ [1]

(d) average speed for journey to school and average time for journey to school.

Answer _____ [1]



16 The heights (in centimetres) of fifteen girls in a Dance Class are:

151 173 157 165 166 168 170 169
 169 169 168 171 154 176 177

Construct a stem and leaf diagram to illustrate these heights.

Examiner Only

Marks	Remark
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[3]

Total Question 16

[Turn over



17

Primus Energy Gas Tariff

Standing charge is 7.93p per day

Gas used is 4.433p per unit

Examiner Only

Marks

Remark

Marie's gas meter was read on 1st March.

The reading was

0	1	9	5	7
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The meter was read again on 1st June.

The reading was

0	4	1	0	8
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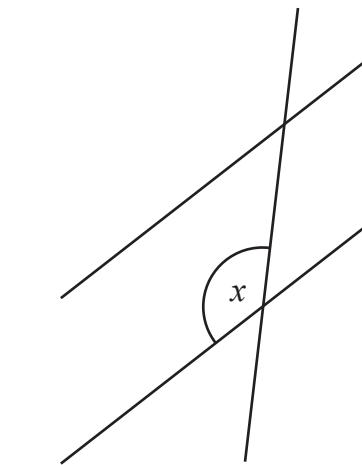
Calculate the total gas bill that Marie will have to pay for the 92 days from 1st March, if VAT is charged at 5% on the total.

Answer £ _____ [5]

Total Question 17



18 (a) Mark the angle corresponding to angle x on the diagram.



[1]

(b) Calculate the sum of the interior angles of a regular octagon.

Answer _____° [2]

(c) Is it possible to have a regular polygon with an interior angle of 130° ?
Explain your answer.

[2]

Total Question 18

19 Convert $62\ 000\ \text{cm}^2$ into m^2 .

Answer _____ m^2 [2]

Total Question 19



20 Solve $\frac{2x}{5} - 3 = 7$

Examiner Only	
Marks	Remark

Answer $x = \underline{\hspace{2cm}}$ [2]

Total Question 20

21 Derek is trying to find a number x such that $x^2 + \sqrt{x} = 90$

He knows the answer is between 9 and 10

Use trial and improvement to find Derek's number to **2 decimal places**.

Show your work.

Total Question 21

Answer Derek's number is $\underline{\hspace{2cm}}$ [4]



22 (a) (i) Write 210 as a product of prime factors.

Examiner Only

Marks

Remark

Answer _____ [2]

(ii) Find the LCM of 210 and 84

Answer _____ [2]

(iii) Find the HCF of 210 and 84

Answer _____ [1]

(b) Andrea opened an account using £720 with the Eastern Bank.
After one year, the bank paid interest into her account.
She then had £747.27 in her account.
Work out, as a percentage, Eastern Bank's interest rate on the account.

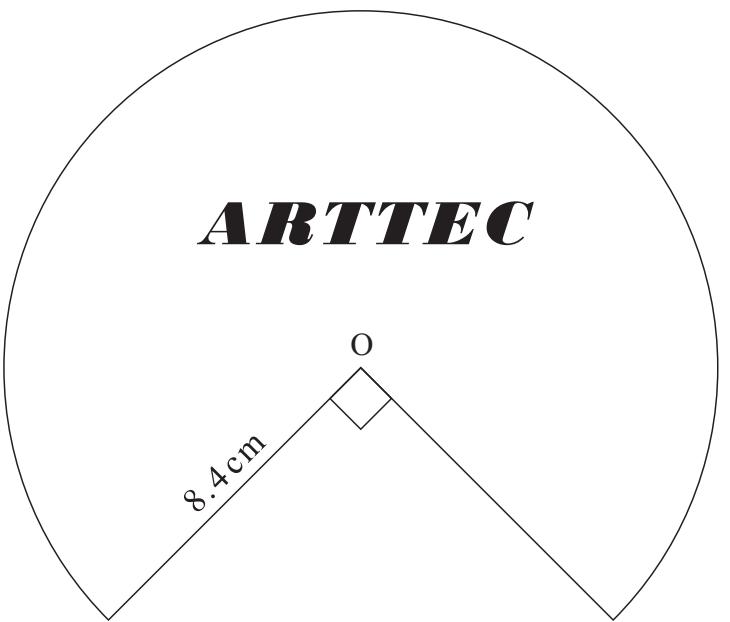
Total Question 22

Answer _____ % [3]

[Turn over



23 A company logo is shown below. It is $\frac{3}{4}$ of a circle, centre O.



Calculate the perimeter of the logo.

Answer _____ cm [3]

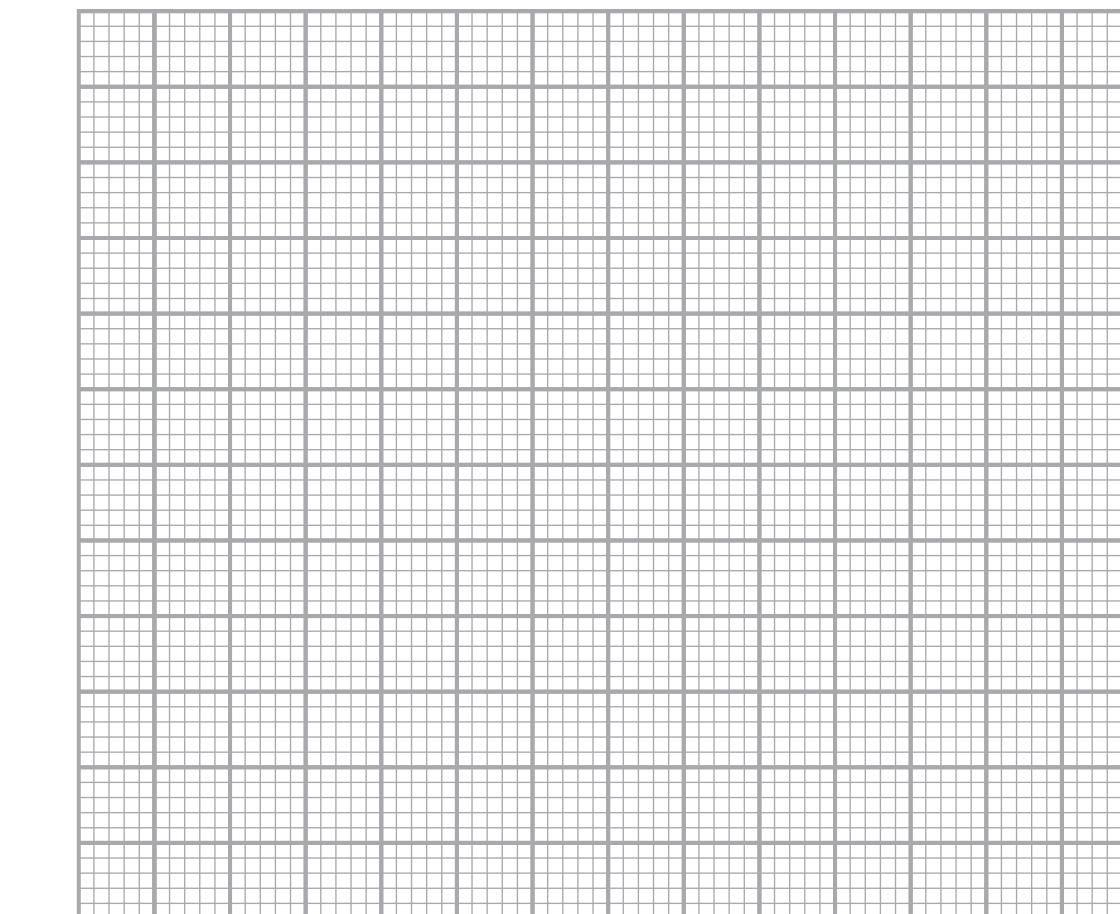
Total Question 23



24 The number of items that 80 students had in their sports bags was recorded. The numbers were grouped as shown in the table.

Number (n)	Frequency
$2 < n \leq 4$	8
$4 < n \leq 6$	24
$6 < n \leq 8$	18
$8 < n \leq 10$	17
$10 < n \leq 12$	9
$12 < n \leq 14$	4

(a) Show this information on a frequency polygon.



[3]

(b) Which class interval contains the median number?

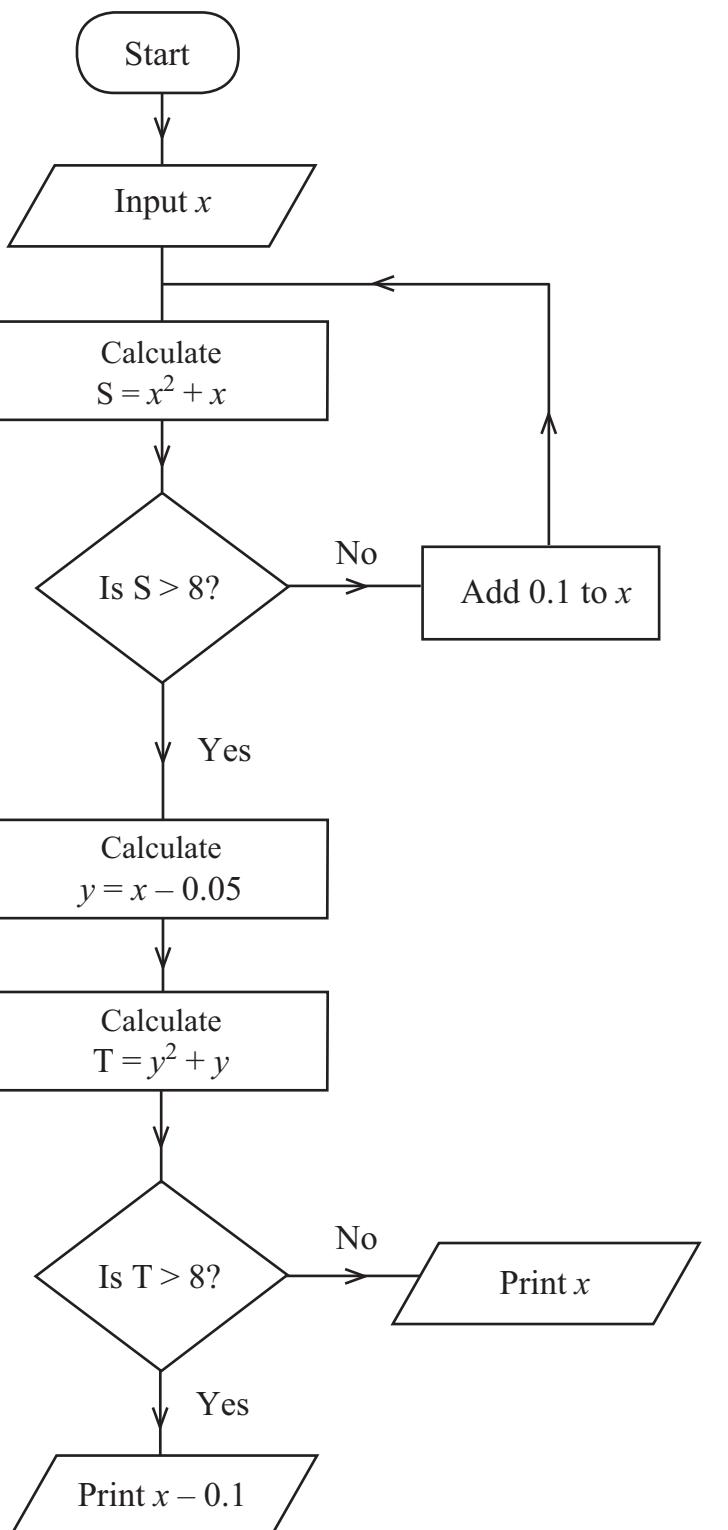
Answer _____ [1]

Total Question 24

[Turn over



25



Starting with $x = 2.0$ use the flow chart to find the value printed.

x	S	y	T

Examiner Only

Marks

Remark

Answer Print _____ [4]

Total Question 25

Quality of written communication will be assessed in this question.

26 The dimensions of three triangles are given:

Triangle A: 5 cm 6 cm 8 cm

Triangle B: 5 cm 12 cm 13 cm

Triangle C: 5 cm 10 cm 12 cm

Only one of these triangles is right-angled. Which one?

Explain your answer clearly.

Triangle: _____ because _____

[3]

Total Question 26

[Turn over

27 Find the value of x when $5x^3 = 135$

Examiner Only

Marks | Remark

Answer $x = \underline{\hspace{2cm}}$ [1]

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Total Question 27



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8166



28GMT2125

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8166



28GMT2126

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28GMT2127

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Question Number	Marks
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Total Marks	
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Examiner Number

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