



**Surname** \_\_\_\_\_

**Other Names** \_\_\_\_\_

**Centre Number** \_\_\_\_\_

**Candidate Number** \_\_\_\_\_

**Candidate Signature** \_\_\_\_\_

**GCSE  
MATHEMATICS**

**F**

**Foundation Tier Paper 2 Calculator**

**8300/2F**

**Thursday 7 June 2018 Morning**

**Time allowed: 1 hour 30 minutes**

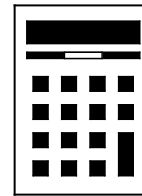
**At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.**

**[Turn over]**



**For this paper you must have:**

- a calculator
- mathematical instruments.



## **INSTRUCTIONS**

- **Use black ink or black ball-point pen. Draw diagrams in pencil.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **Do all rough work in this book. Cross through any work you do not want to be marked.**



## **INFORMATION**

- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 80.**
- **You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.**

## **ADVICE**

- **In all calculations, show clearly how you work out your answer.**

**DO NOT TURN OVER UNTIL TOLD TO DO SO**



4

**Answer ALL questions in the spaces provided**

**1 Circle the expression that can be written as  $2y$  [1 mark]**

$$y + y$$

$$y^2$$

$$2 + y$$

$$y \times y$$

**2 Circle the decimal that is greater**

**than  $\frac{3}{10}$  and less than  $\frac{2}{5}$**

**[1 mark]**

**0.32**

**0.035**

**0.4**

**0.24**



**5**

- 3** What is 625 as a power of 5 ?  
Circle your answer. [1 mark]

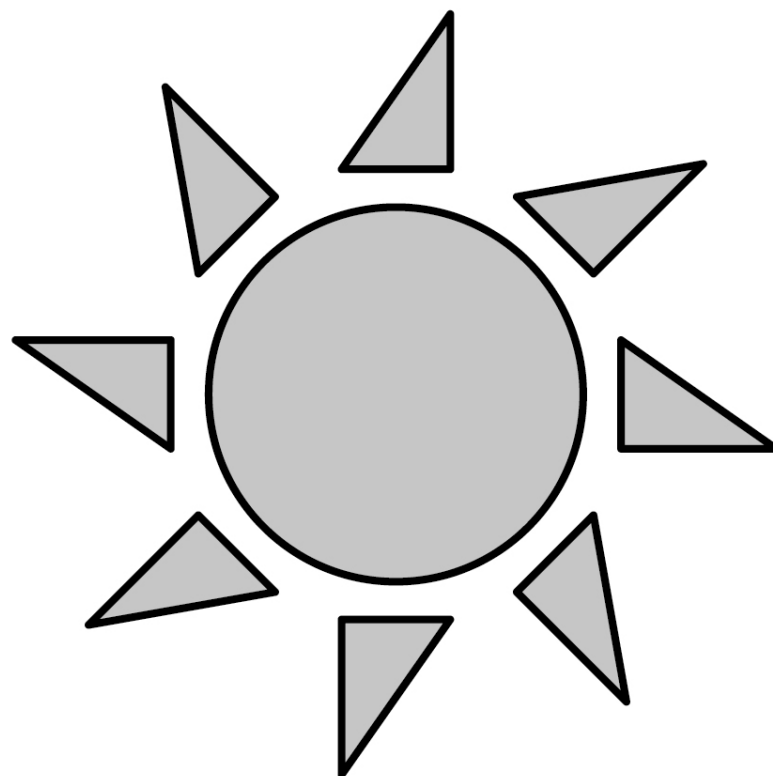
$5^3$

$5^4$

$5^5$

$5^{125}$

- 4** Circle the order of rotational symmetry of this drawing.  
[1 mark]

**0****2****4****8**

**[Turn over]**



6

5 Work out the value of

$$3^6 - \sqrt{841} \quad [2 \text{ marks}]$$

---

---

---

---

Answer

---

6



7

**BLANK PAGE**

**[Turn over]**



8

- 6 Gemma has four groups of friends on a social media site. The table shows the number of friends in each group.**

<b>Group</b>	<b>Number of friends</b>
<b>Family</b>	<b>8</b>
<b>Netball</b>	<b>8</b>
<b>School</b>	<b>26</b>
<b>Guides</b>	<b>11</b>

- 6 (a) Which group is the mode?  
[1 mark]**

**Answer** \_\_\_\_\_





9

- 6 (b) Gemma wants a pictogram to show the information. She has drawn the first two rows. Complete the pictogram. Remember to complete the key. [3 marks]**

**Key:** ○ represents \_\_\_\_\_ friends

<b>Family</b>	○ ○
<b>Netball</b>	○ ○
<b>School</b>	
<b>Guides</b>	

**[Turn over]**



10

7  $e$  is 3 MORE than  $d$ .  
 $f$  is 5 LESS than  $d$ .

7 (a) Write an expression for  $e$  in terms of  $d$ . [1 mark]

Answer \_\_\_\_\_

7 (b) Write an expression for  $f$  in terms of  $d$ . [1 mark]

Answer \_\_\_\_\_

7 (c) Work out  $e - f$   
Simplify your answer. [2 marks]

---

---

---

---

---

Answer \_\_\_\_\_



11

**8 The numbers 1 to 12 are put in a grid.**

**2, 4, 5, 7, 10 and 12 are shown.**

		<b>5</b>	<b>10</b>
<b>12</b>			
<b>4</b>			
<b>7</b>		<b>2</b>	

**Each of the four sides of the grid must add up to 26**

**Complete the grid using the numbers**

**1, 3, 6, 8, 9 and 11**

**[3 marks]**

**[Turn over]**



# 12

**9** In this question, use  
**1 foot = 12 inches**  
**1 inch = 2.5 centimetres**  
**Change 5 feet 8 inches**  
**to centimetres. [3 marks]**

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_ **cm**

13

10 Which of these numbers has EXACTLY FOUR factors?

Circle your answer. [1 mark]

4

8

12

16

---

**7**

[Turn over]

14

- 11 Nick has a 6-digit code.**
- He remembers it as three 2-digit numbers.**
- The first number is between 10 and 20**
- The second number is 3 times the first number.**
- The third number is 5 times the first number.**
- All six digits are DIFFERENT.**
- Work out the code. [3 marks]**

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_



15

12 How many minutes are there in

$5\frac{1}{4}$  hours?

Circle your answer. [1 mark]

315

325

515

525

[Turn over]



## 16

**13** Here is a formula for the amount of water needed to cook rice.

$$w = 1.5r + 0.5$$

$w$  is the number of cups of water needed

$r$  is the number of cups of rice to be cooked

**13 (a)** How many cups of water are needed to cook 7 cups of rice?  
[2 marks]

---

---

---

---

**Answer** \_\_\_\_\_



17

**13 (b) How many cups of rice can be cooked with 20 cups of water?  
[3 marks]**

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_

9
---

**[Turn over]**



18

- 14 (a) Use your calculator to work out**  
 **$9.95^2 \times 29.8$**   
**Give your answer as a decimal.**  
**Write down your full calculator**  
**display. [1 mark]**

---

---

---

**Answer** \_\_\_\_\_



19

14 (b) Is your answer to part (a) sensible?

Use approximations to decide.  
You **MUST** show your working.  
[3 marks]

---

---

---

---

---

---

---

---

---

---

---

---

Tick a box.

Sensible

Not sensible

[Turn over]



20

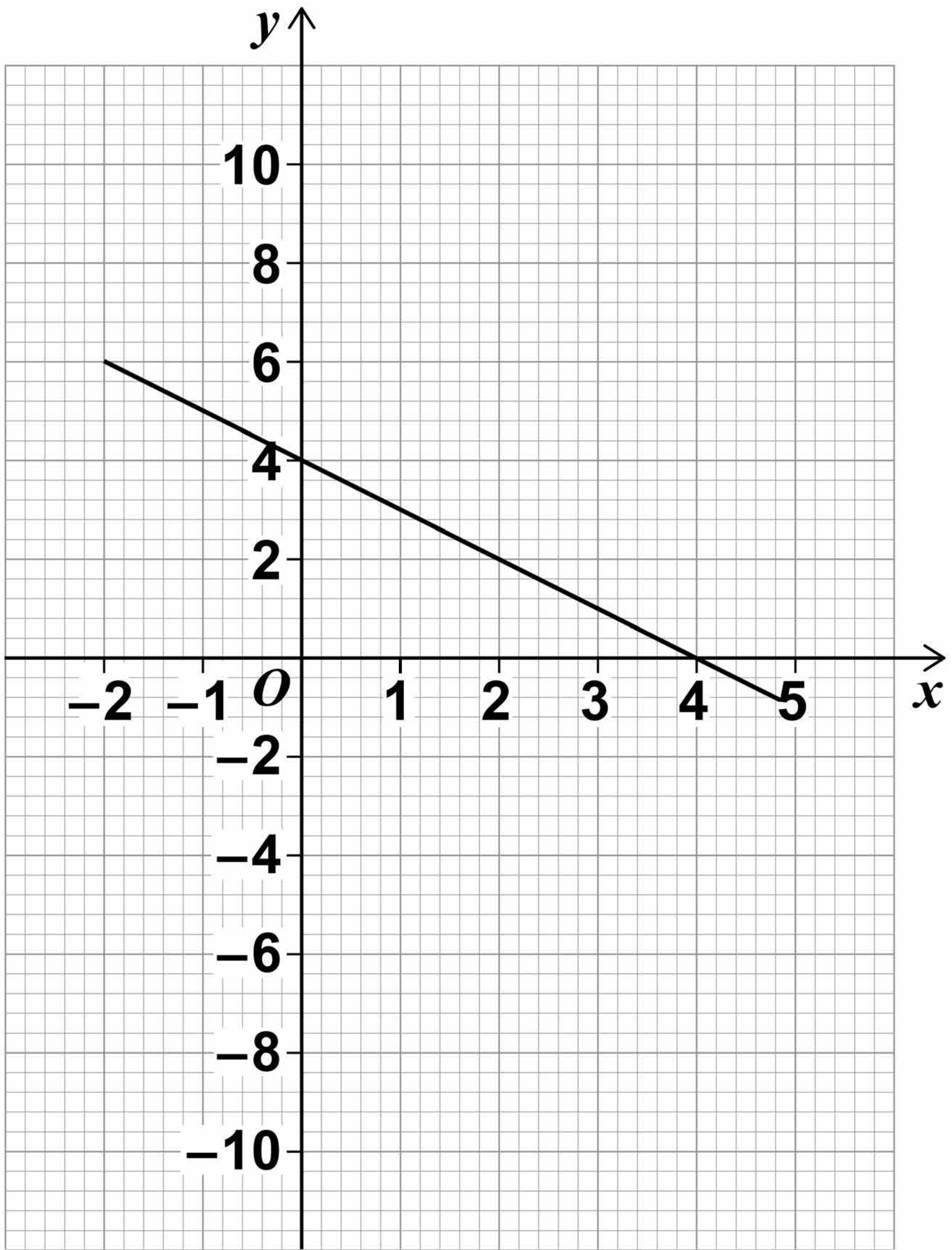
**15** The graph of  $y = 4 - x$  for values of  $x$  from  $-2$  to  $5$  is shown on the grid opposite.

**15 (a)** On the grid, draw the graph of  $y = 2x - 5$  for values of  $x$  from  $-2$  to  $5$  [3 marks]

**15 (b)** Use your graph to solve  $2x - 5 = 4 - x$  [1 mark]

$x =$  \_\_\_\_\_





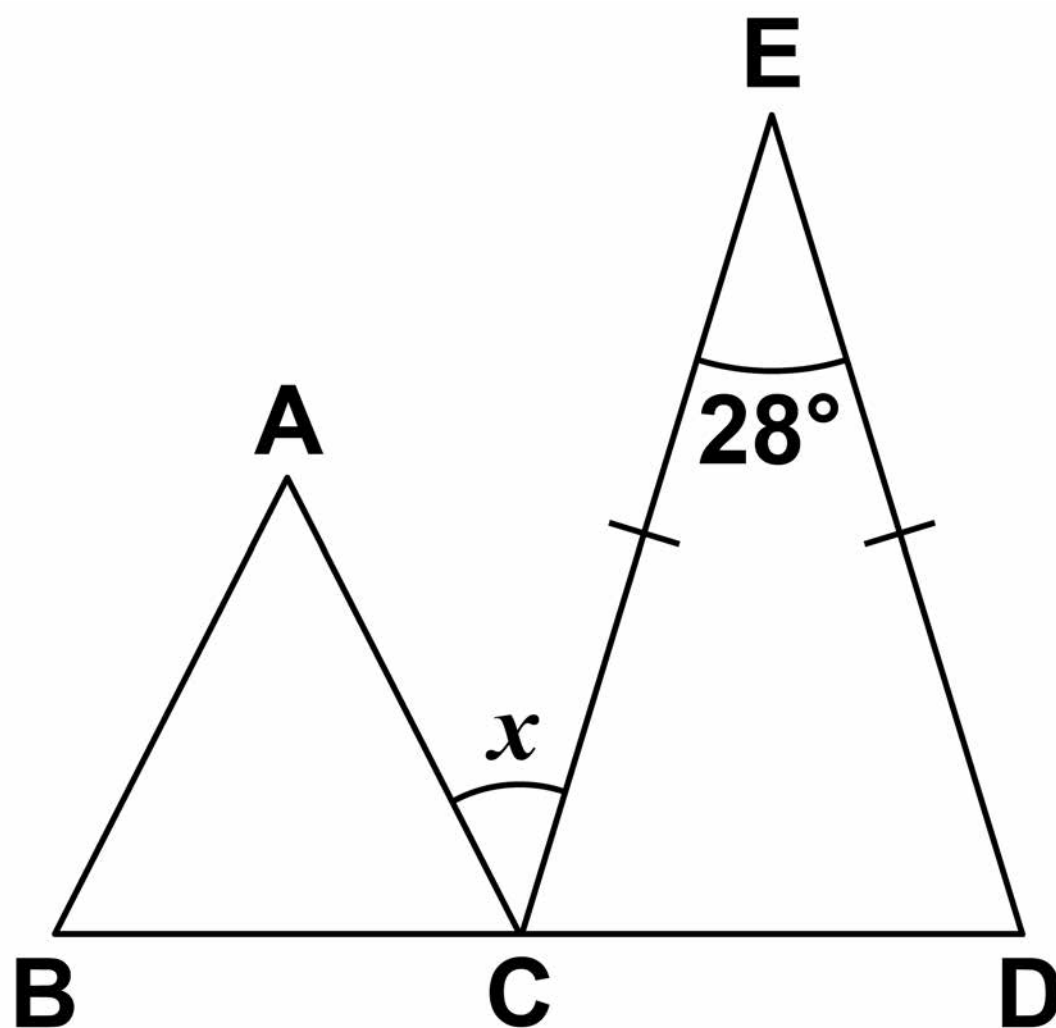
8

[Turn over]



22

- 16 (a)  $BCD$  is a straight line.  
Triangle  $ABC$  is equilateral.  
 $CE = DE$   
The diagram is not drawn accurately.



Work out the size of angle  $x$ .  
[4 marks]

---

---

---

---



23

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_ **degrees**

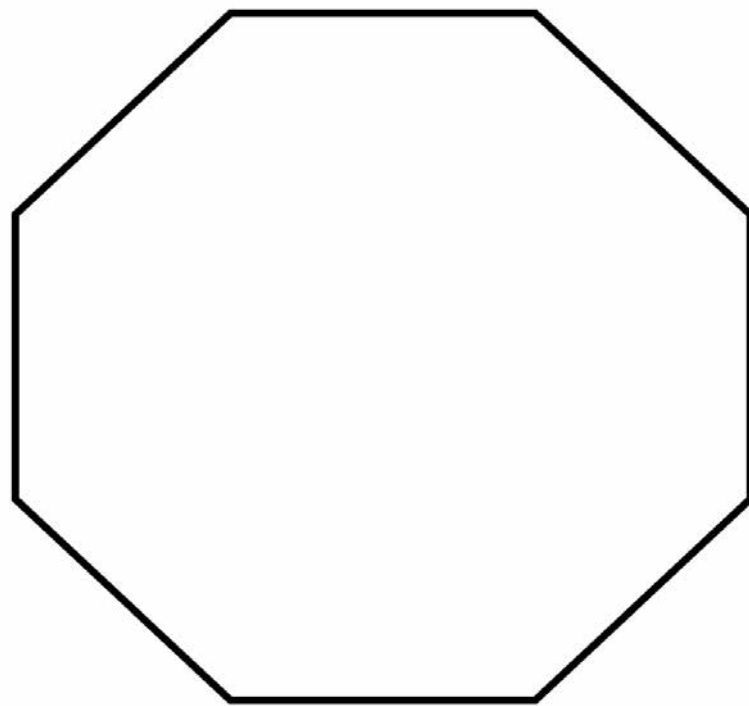
**[Turn over]**



24

**16 (b) Amba is working out the size of an INTERIOR angle of a regular octagon.**

**The diagram is not drawn accurately.**



**Her method is  
Interior angle =  $360 \div 8$   
Is her method correct?  
Tick a box.**

**Yes****No**



**25**

**Give a reason for your answer.  
[1 mark]**

---

---

---

---

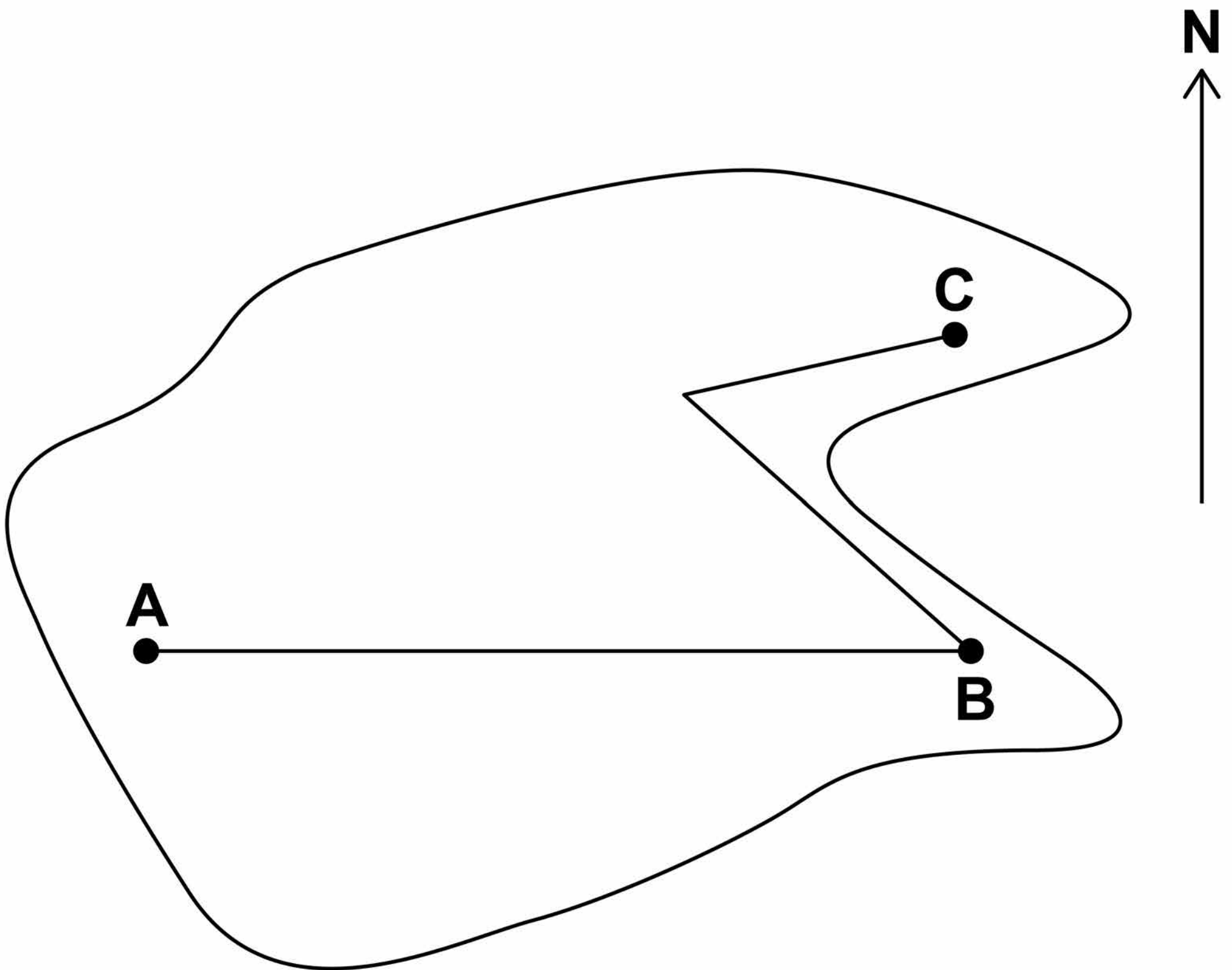
<hr/>
<b>5</b>

**[Turn over]**



- 17 Here is a map of an island with cities A, B and C.  
The straight lines represent roads.

**SCALE: 1 cm represents 200 km**  
**Take the length of this line to be 1 cm** —



27

**17 (a) A is due West of B.  
Write down the bearing of  
A from B. [1 mark]**

**Answer \_\_\_\_\_ degrees**

**[Turn over]**



# BLANK PAGE



29

- 17 (b) Umar drives from A to B on the route shown.  
Kaz drives from B to C on the route shown.  
Use the map to work out how much further Umar drives than Kaz.  
You MUST show your working.  
[5 marks]**

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_ **km**

**[Turn over]**

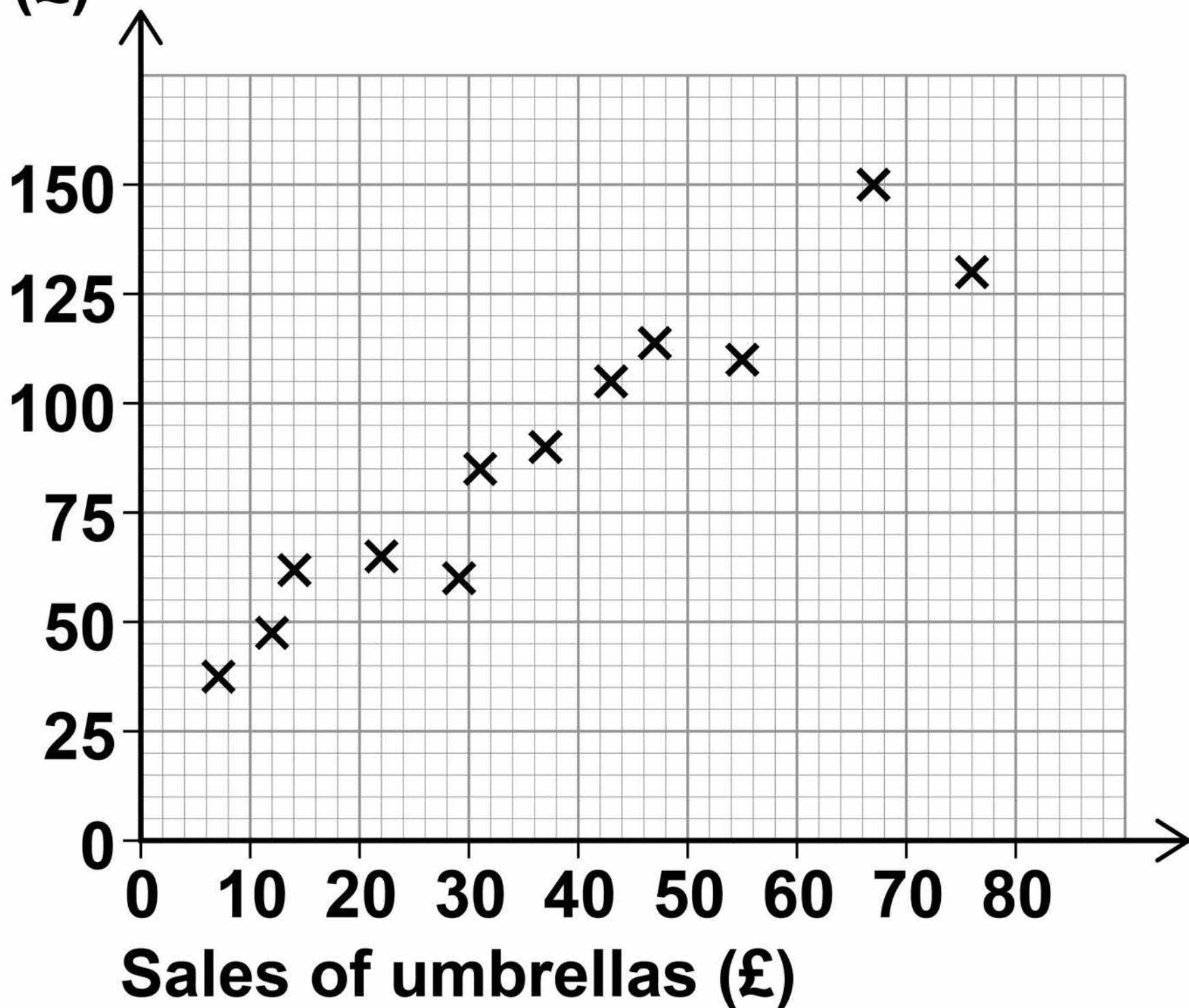
6
---



30

- 18 A shop sells raincoats and umbrellas.  
The scatter graph shows the monthly sales for 12 months.  
Sales of raincoats and umbrellas

Sales of  
raincoats  
(£)



31

**18 (a) Write down the type of correlation shown by the graph. [1 mark]**

**Answer** \_\_\_\_\_

**18 (b) The manager expects the sales of umbrellas next month to be £60**

**Draw a line of best fit to estimate the sales of raincoats next month. [3 marks]**

**Answer** £ \_\_\_\_\_

**[Turn over]**



32

- 19 Multiply out  $x(x - 4)$   
Circle your answer. [1 mark]

$x^2 - 4$

$2x - 4$

$x^2 - 4x$

$-3x^2$

- 20  $a : b = 5 : 2$   
How many times larger is  
 $a$  than  $b$ ?  
Circle your answer. [1 mark]

0.4

1.5

2.5

3

6





**BLANK PAGE**

**[Turn over]**



34

**21 (a) A circle has radius 4.2 cm**

**Work out the length of the circumference.**

**Give your answer to 1 decimal place. [3 marks]**

---

---

---

---

---

---

---

---

---

---

---

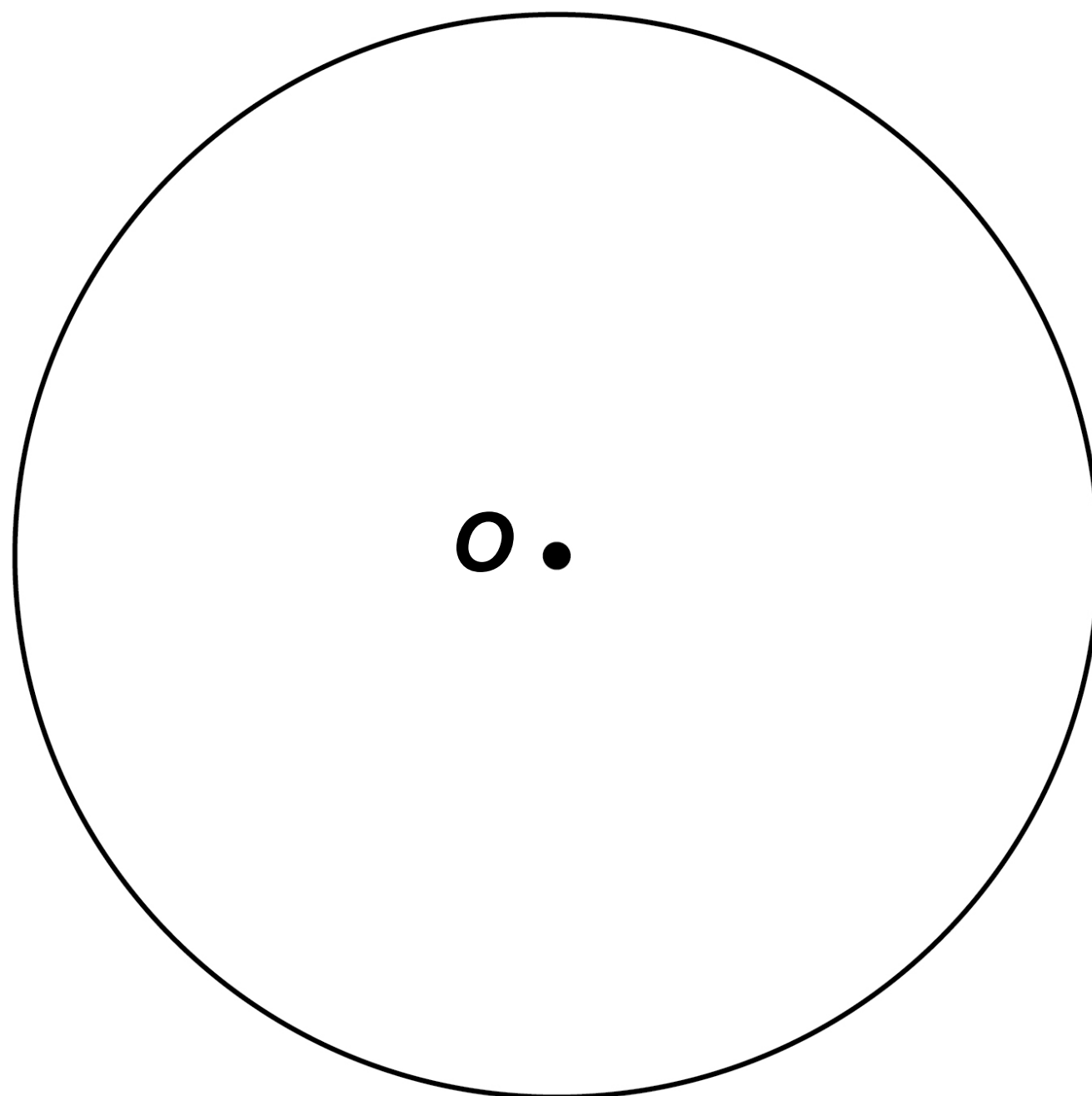
**Answer** \_\_\_\_\_ **cm**



35

21 (b) The circle below has centre  $O$ .

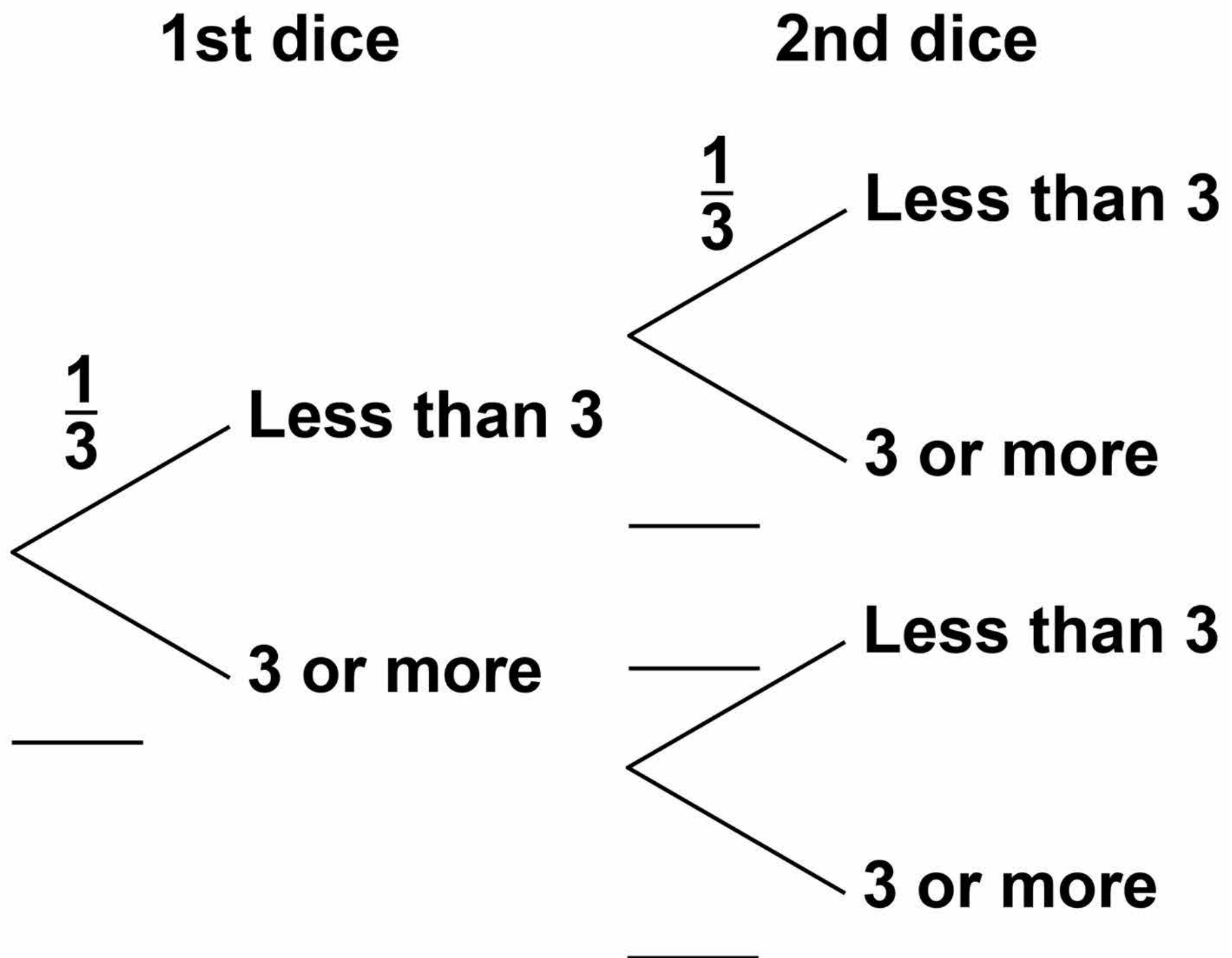
Draw a sector on the circle.  
[1 mark]



[Turn over]

22 Two ordinary fair dice are rolled.

22 (a) Complete the tree diagram.  
[1 mark]



37

**22 (b) Work out the probability that BOTH dice land on a number less than 3 [1 mark]**

---

---

---

**Answer** \_\_\_\_\_

6

**[Turn over]**



**23 Match each sequence to its description.**

**One has been done for you.  
[4 marks]**

**1 1 2 3 5 8**

**Arithmetic  
progression**

**1 2 4 8 16 32**

**Geometric  
progression**

**1 2 3 4 5 6**

**Fibonacci  
sequence**

**1 3 6 10 15 21**

**Triangular  
numbers**

**1 4 9 16 25 36**

**Cube  
numbers**

**1 8 27 64 125 216**

**Square  
numbers**



**BLANK PAGE**

**[Turn over]**



**24** The table shows information about the population of a city.

<b>Population in 2001</b>	<b>Population in 2011</b>
<b>420 000</b>	<b>480 000</b>

**Liam claims,  
“From 2011 to 2021 the  
population of the city will  
increase by the same percentage  
as from 2001 to 2011”**

**He works out,  
population increase from 2001 to  
2011**

$$= 480\,000 - 420\,000$$

$$= 60\,000$$

**population in 2021**

$$= 480\,000 + 60\,000$$

$$= 540\,000$$





41

**Does the population of 540 000 match his claim?**

**You MUST show your working.  
[3 marks]**

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_

7

**[Turn over]**



42

- 25** On three days, Ali throws darts at a target.  
Here are his results.

	<b>Number of throws</b>	<b>Number of hits</b>	<b>Number of misses</b>
<b>Monday</b>	<b>20</b>	<b>15</b>	<b>5</b>
<b>Tuesday</b>	<b>30</b>	<b>22</b>	<b>8</b>
<b>Wednesday</b>	<b>40</b>	<b>17</b>	<b>23</b>
<b>Total</b>	<b>90</b>	<b>54</b>	<b>36</b>



**25 (a) Work out TWO different estimates for the probability of Ali hitting the target. [2 marks]**

---

---

---

---

**Answer** \_\_\_\_\_ **and** \_\_\_\_\_

**25 (b) Which of your two answers is the better estimate for the probability of Ali hitting the target?**

**Give a reason for your answer.  
[1 mark]**

**Answer** \_\_\_\_\_

**Reason** \_\_\_\_\_

---

---

**[Turn over]**



44

**26** Theo starts with savings of £18  
James starts with no savings.

**Each week from now,  
Theo will save £4.50 and  
James will save £4**

**In how many weeks will Theo and  
James have savings in the ratio  
15 : 8 ? [3 marks]**

---

---

---

---

---

---

---

---

---

---

---

---



45

---

---

---

---

---

---

**Answer** \_\_\_\_\_

6

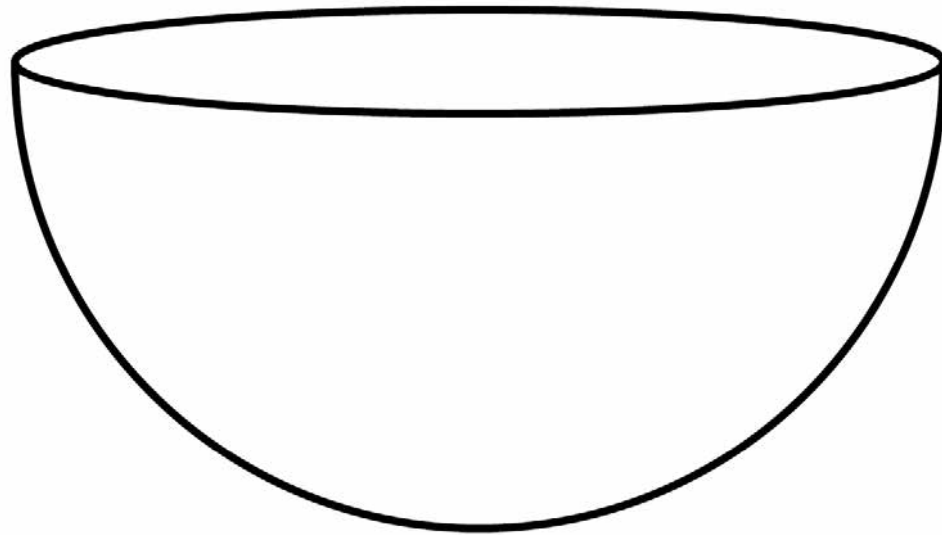
**[Turn over]**



27

Volume of a sphere =  $\frac{4}{3}\pi r^3$   
where  $r$  is the radius

A container is a hemisphere of radius 30 cm



Sand fills the container at a rate of  $4000 \text{ cm}^3$  per minute.

Does it take **LESS THAN** a quarter of an hour to fill the container?

You **MUST** show your working.  
[3 marks]



---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Answer** \_\_\_\_\_

**[Turn over]**



48

**28** The length of each side of a regular pentagon is 8.4 cm to 1 decimal place.

**28 (a)** Complete the error interval for the length of one side. [2 marks]

---

---

\_\_\_\_\_ cm  $\leq$  length < \_\_\_\_\_ cm

**28 (b)** Complete the error interval for the perimeter. [1 mark]

---

---

\_\_\_\_\_ cm  $\leq$  perimeter < \_\_\_\_\_ cm

6

**END OF QUESTIONS**





**There are no questions printed on this page**



# There are no questions printed on this page

For Examiner's Use	
Pages	Mark
4–6	
8–10	
11–13	
14–17	
18–21	
22–25	
26–29	
30–32	
34–37	
38–41	
42–45	
46–48	
<b>TOTAL</b>	

## Copyright information

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk) after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2018 AQA and its licensors. All rights reserved.

# IB/M/Jun18/AMAS/8300/2F/E3

