

**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**

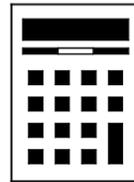
**At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.**

**[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**



**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]

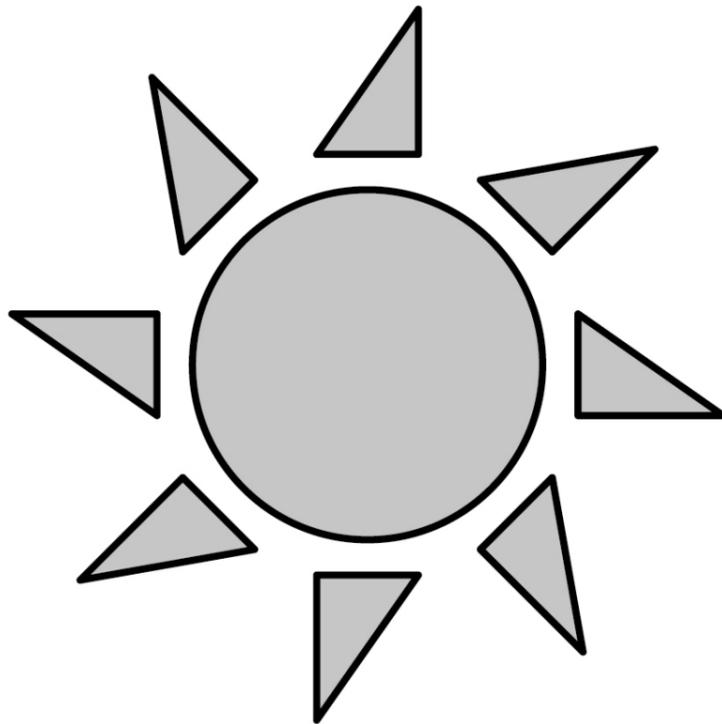
$5^3$

$5^4$

$5^5$

$5^{125}$

**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

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

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Answer

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6



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**[Turn over]**



- 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** \_\_\_\_\_



- 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]**

- 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]

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Answer \_\_\_\_\_



**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]**





**10** Which of these numbers has **EXACTLY FOUR** factors?

**Circle your answer. [1 mark]**

**4**

**8**

**12**

**16**

<hr/>
<b>7</b>

**[Turn over]**

**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]**

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**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]**



**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]

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



- 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]**

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

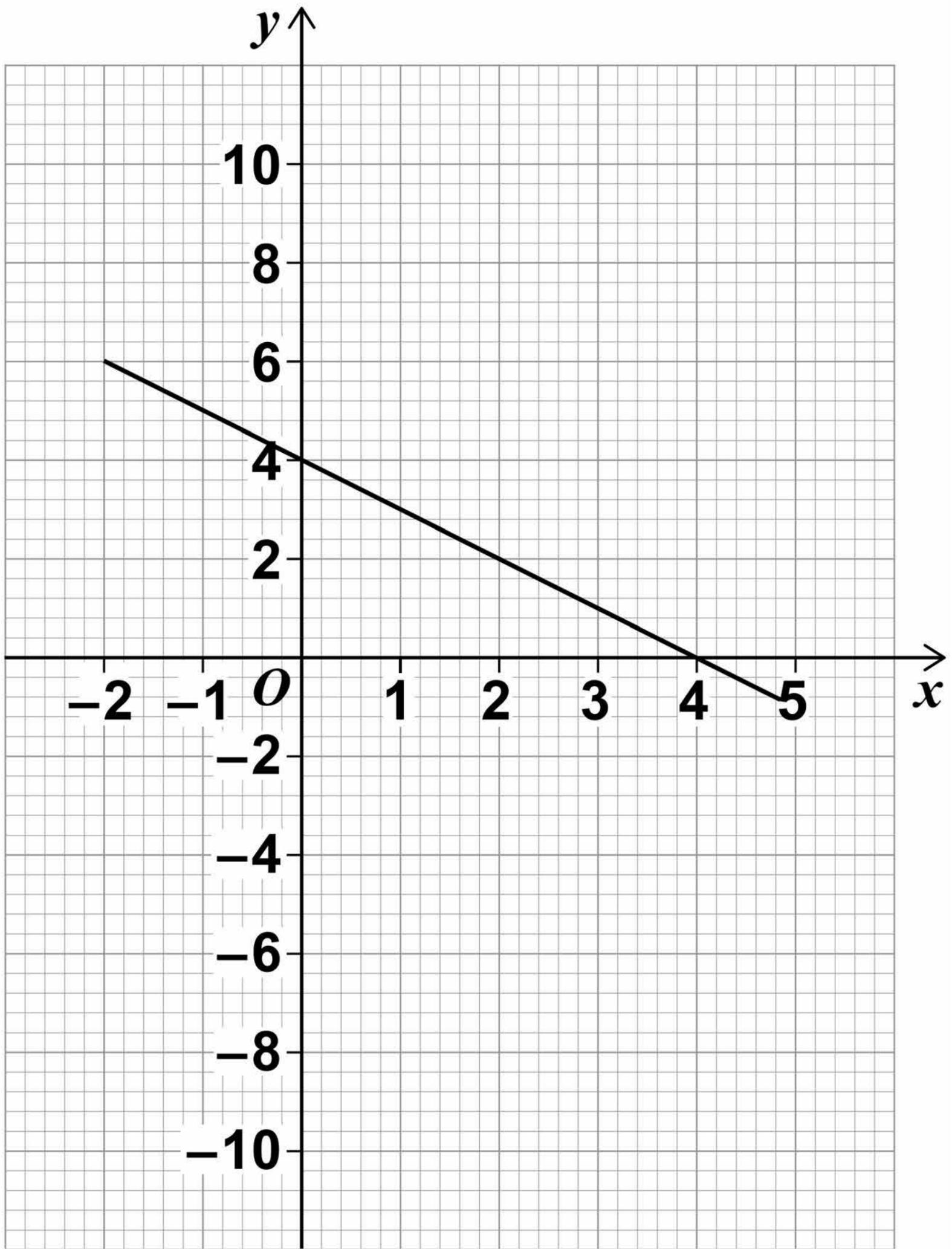


**15** The graph of  $y = 4 - x$  for values of  $x$  from  $-2$  to  $5$  is shown on the grid opposite.

**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]

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

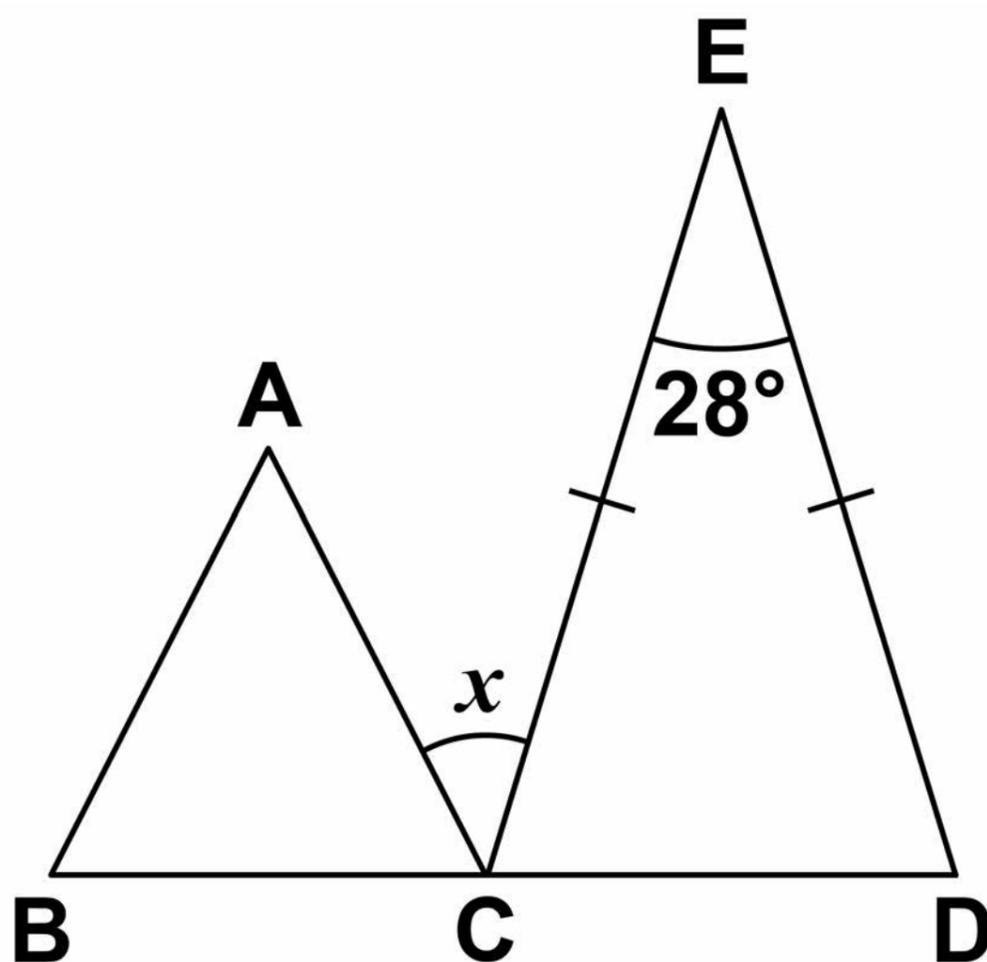


[Turn over]

8



- 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]

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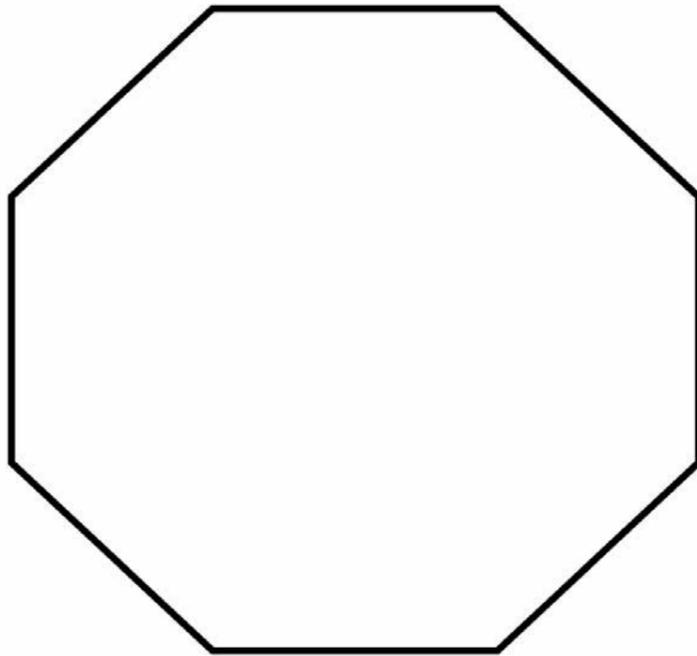
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**16 (b) Amba is working out the size of an INTERIOR angle of a regular octagon.**

**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]**

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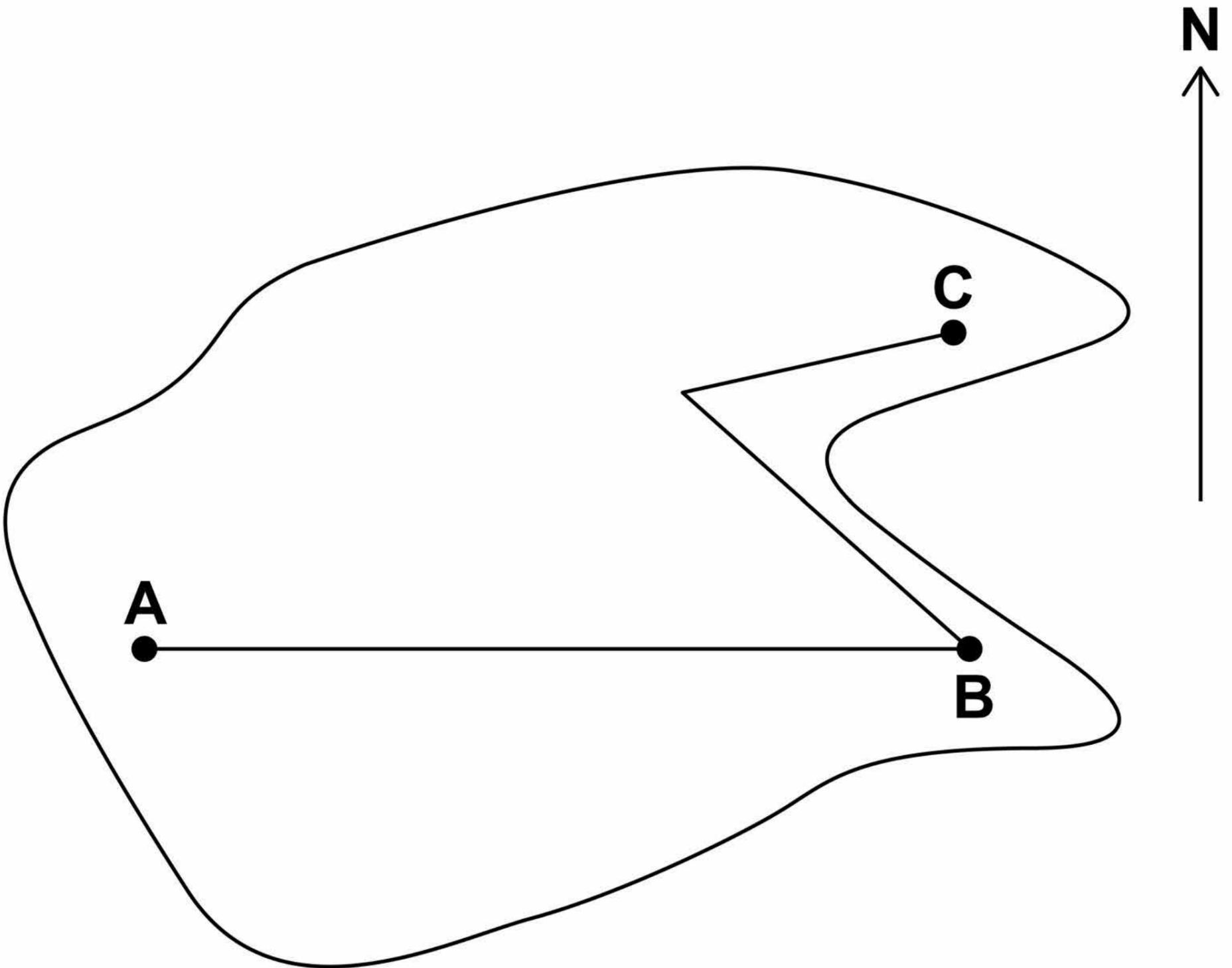
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<b>5</b>

**[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 —



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

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

**[Turn over]**

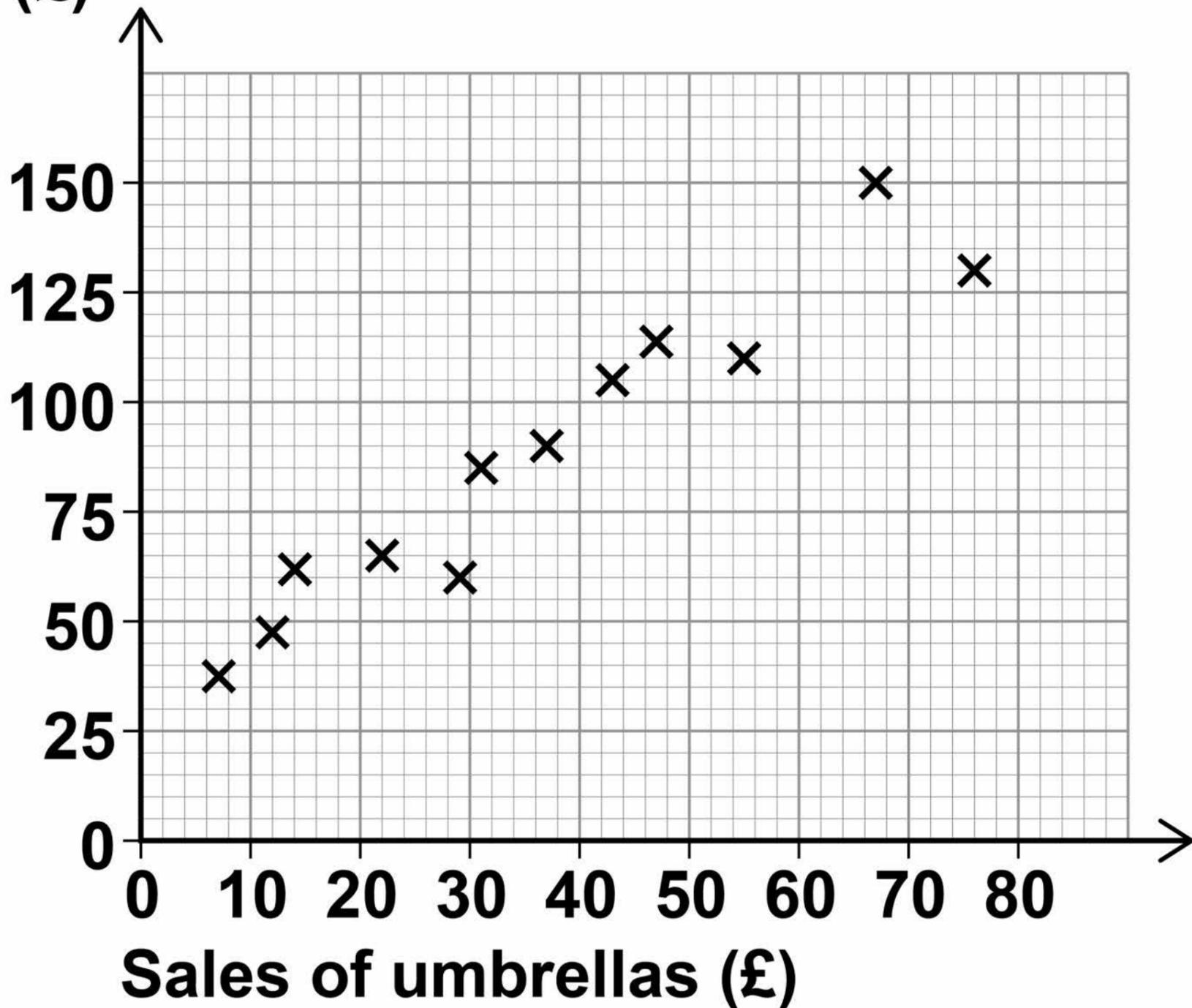
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- 18 A shop sells raincoats and umbrellas.  
The scatter graph shows the monthly sales for 12 months.  
Sales of raincoats and umbrellas

Sales of  
raincoats  
(£)



**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]**

- 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



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**[Turn over]**



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]

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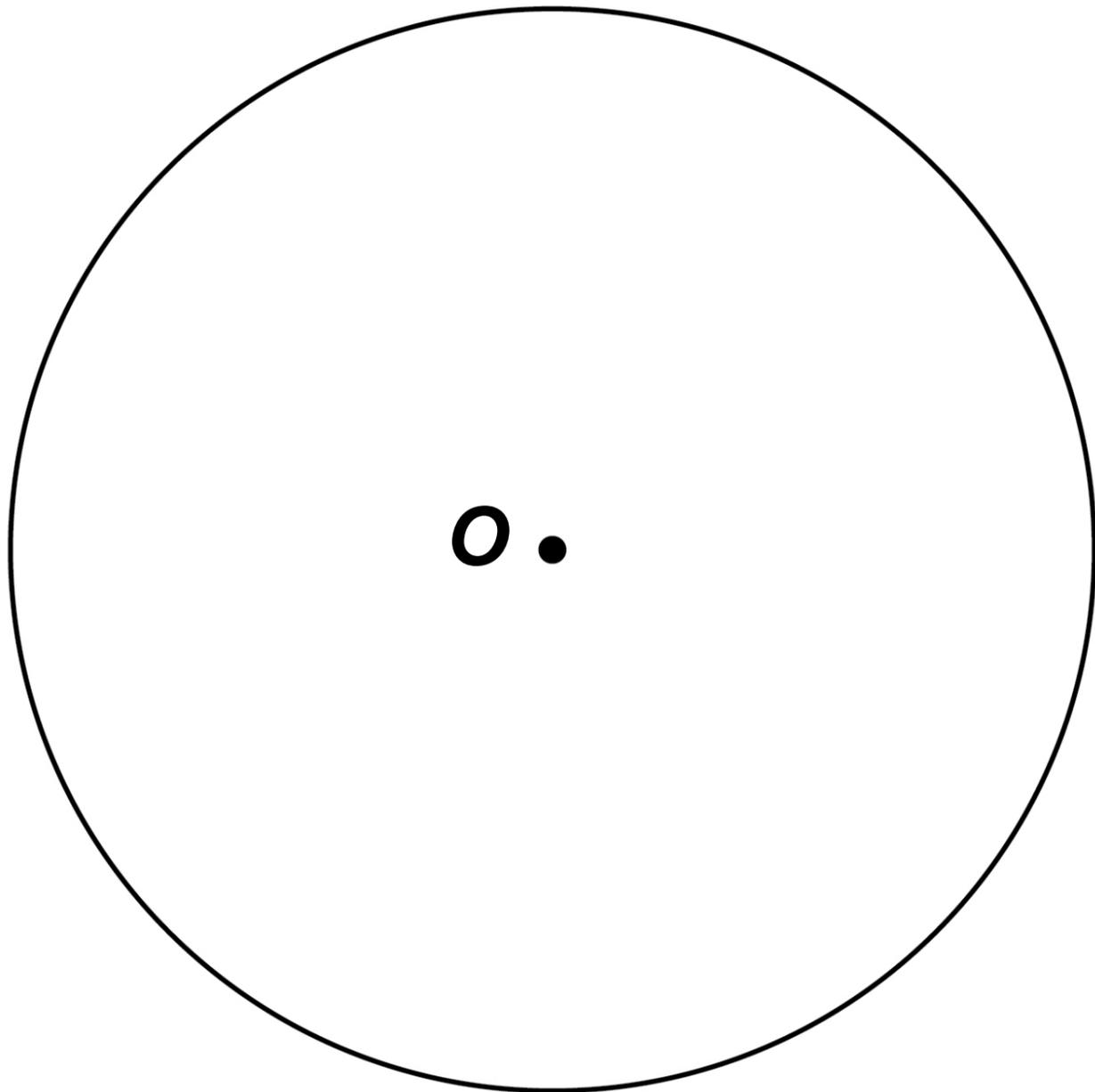
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Answer \_\_\_\_\_ cm

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

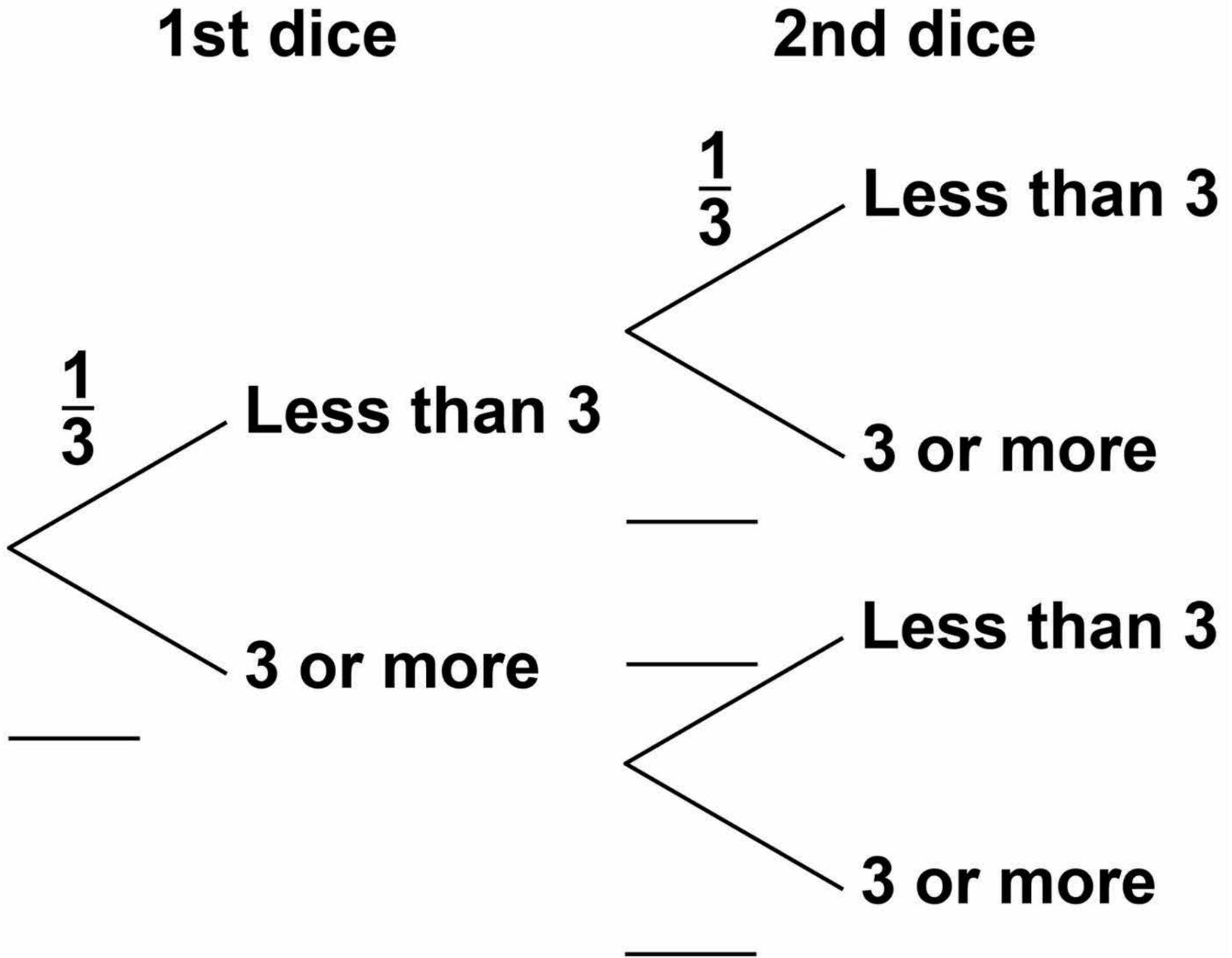
Draw a sector on the circle.  
[1 mark]



[Turn over]

22 Two ordinary fair dice are rolled.

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



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

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**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**



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**[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**

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

$$= 540\,000$$



- 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]**

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**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** \_\_\_\_\_

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**[Turn over]**





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

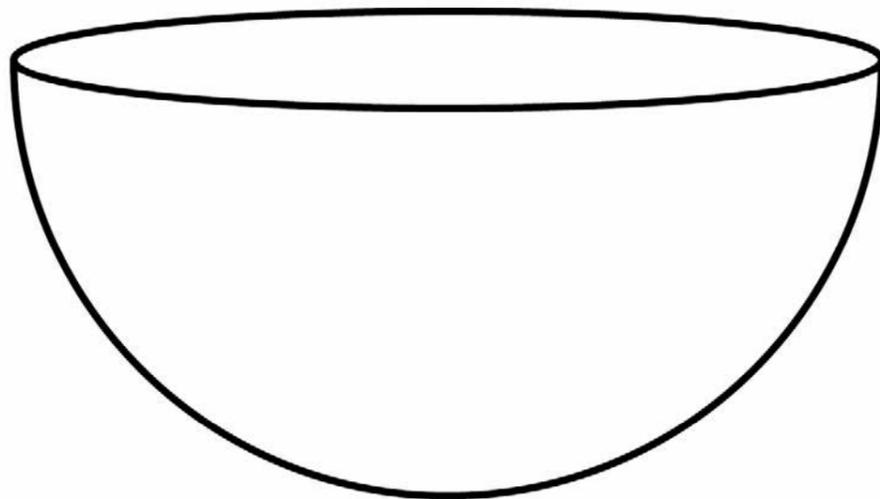
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**[Turn over]**

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]



**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]

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

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

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

6

**END OF QUESTIONS**



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For Examiner's Use	
Pages	Mark
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8–10	
11–13	
14–17	
18–21	
22–25	
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38–41	
42–45	
46–48	
<b>TOTAL</b>	

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