



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

**Forename(s)** \_\_\_\_\_

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

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

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

**I declare this is my own work.**

**GCSE**

**MATHEMATICS**

**F**

**Foundation Tier      Paper 3      Calculator**

**8300/3F**

**Wednesday 14 June 2023**

**Morning**

**Time allowed: 1 hour 30 minutes**

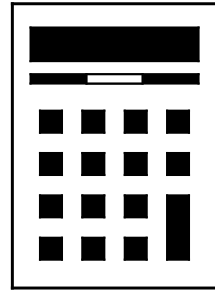
**At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.**

**[Turn over]**



## **MATERIALS**

**For this paper you must have:**



- **a calculator**
- **mathematical instruments**
- **the Formulae Sheet (enclosed).**

## **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.**
- **If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).**

- **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(a) Solve  $5x = 15$  [1 mark]**

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

**1(b) Solve  $y + 7 = 50$  [1 mark]**

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**$y =$**  \_\_\_\_\_



1(c) Solve  $\frac{c}{4} = 8$  [1 mark]

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$c =$  

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[Turn over]



**2 Here is a list of numbers.**

**10    8    2    11    12    15    4    4**

**2 (a) Write down the mode. [1 mark]**

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

**2 (b) Work out the median. [2 marks]**

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

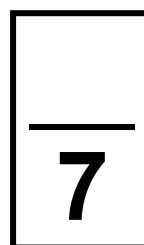
**2(c) Work out the range. [1 mark]**

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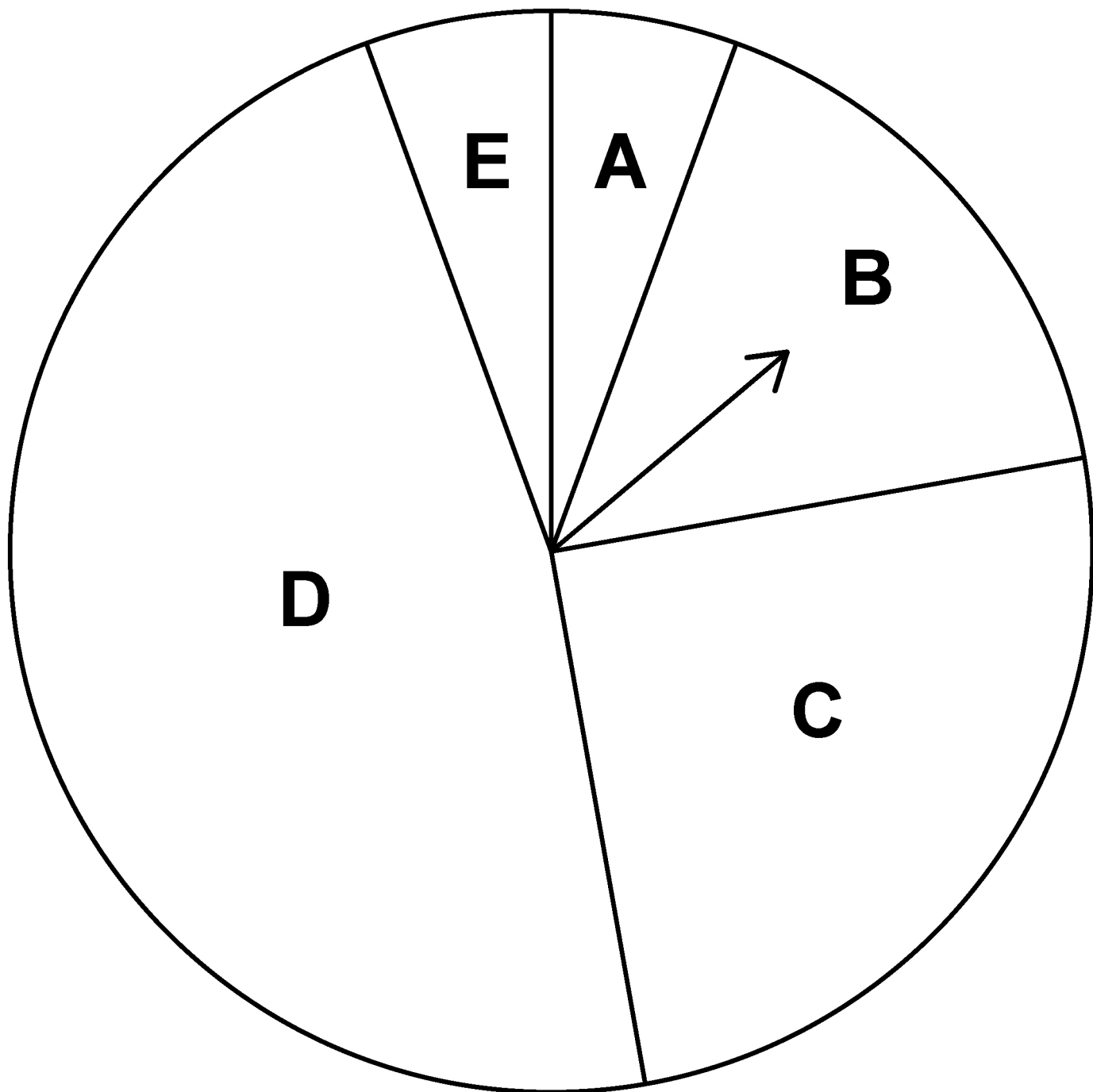
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**Answer** \_\_\_\_\_

**[Turn over]**



**3 (a) A fair spinner with five sections is spun.**





**Complete these statements.  
[2 marks]**

**The spinner is MOST LIKELY to  
land on section \_\_\_\_\_**

**The spinner is EQUALLY LIKELY  
to land on sections \_\_\_\_\_  
and \_\_\_\_\_**

**[Turn over]**



**3 (b) Two different spinners are spun.**

**One spinner has sections labelled with colours.**

**The other spinner has sections labelled with numbers.**

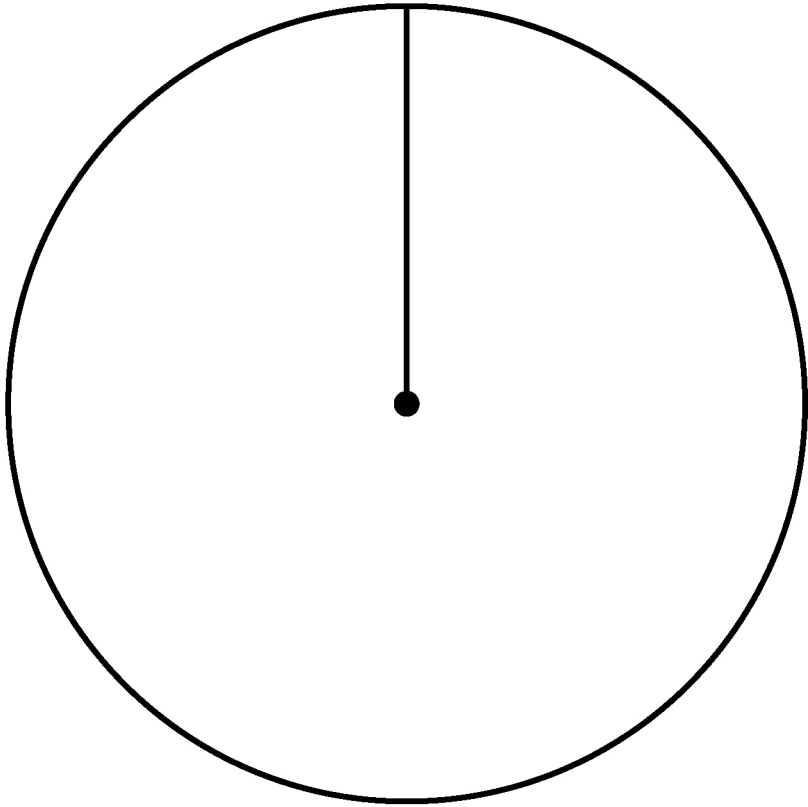
**Here is a list of ALL the possible outcomes.**

<b>Red 1</b>	<b>Red 2</b>	<b>Red 3</b>	<b>Red 4</b>
<b>Blue 1</b>	<b>Blue 2</b>	<b>Blue 3</b>	<b>Blue 4</b>
<b>Green 1</b>	<b>Green 2</b>	<b>Green 3</b>	<b>Green 4</b>

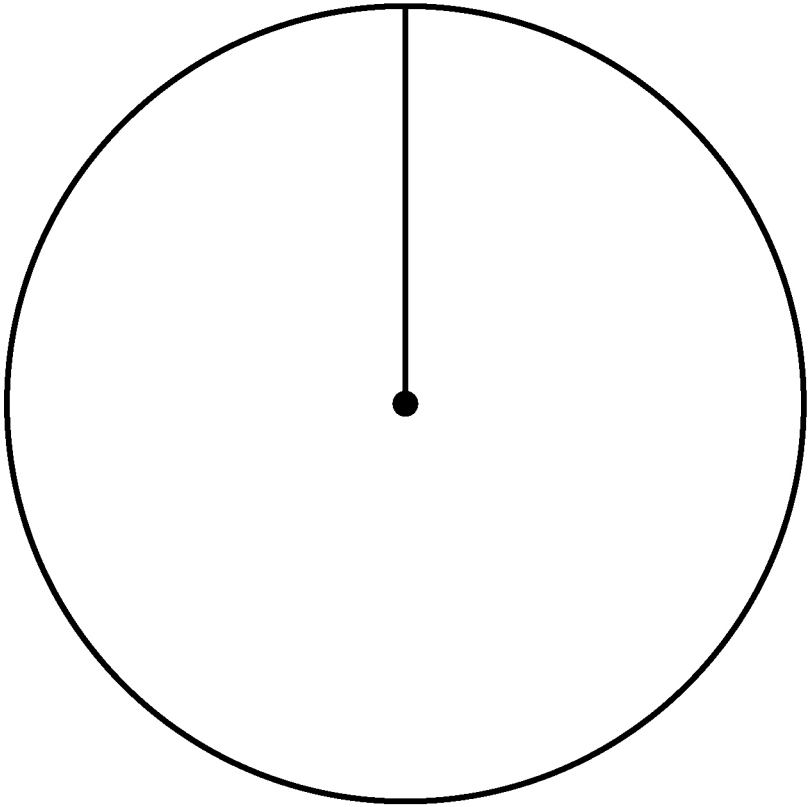
**On the opposite page, show the possible sections on the two spinners. [2 marks]**



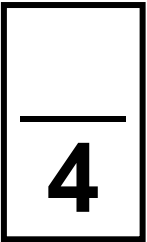
COLOUR



NUMBER



[Turn over]



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**4 A reel holds 9.5 metres of ribbon.**

**2 pieces of ribbon are cut from the reel.**

**Each piece is 20 centimetres long.**

**What length of ribbon is left on the reel?**

**State the units of your answer.  
[3 marks]**

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

**[Turn over]**



**5(a) The term-to-term rule for a sequence is**

**subtract 1 then multiply by 5**

**The 1st term is 4**

**Work out the 3rd term. [2 marks]**

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

**5 (b) The term-to-term rule for a different sequence is**

**add 20 then divide by 2**

**The 2nd term is 50**

**Work out the 1st term. [2 marks]**

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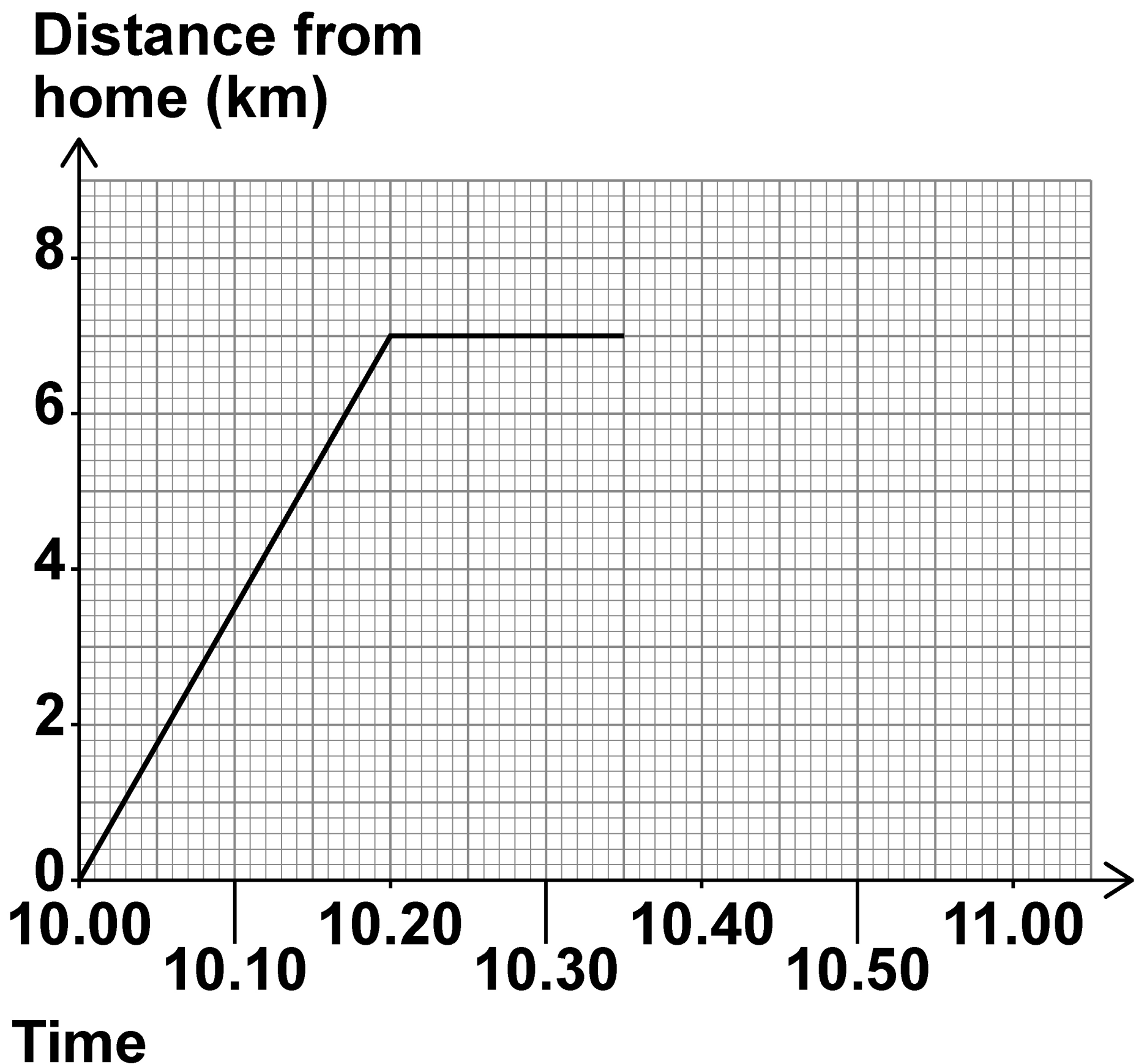
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**Answer** \_\_\_\_\_

**[Turn over]**

- 6 Scarlett leaves home at 10.00 to cycle to the supermarket.

Here is part of a distance-time graph of her trip to the supermarket.





**6(a) She arrives at the supermarket at 10.20**

**How far is the supermarket from her home? [1 mark]**

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

**6(b) She leaves the supermarket at 10.35**

**How long does she stay at the supermarket? [1 mark]**

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

**[Turn over]**



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**6(c) Scarlett cycles home at a constant speed using the same route.**

**It takes her 3 minutes longer than her journey to the supermarket.**

**Complete the distance-time graph, on page 16. [2 marks]**

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**[Turn over]**

7 This week, Liam works

25 hours at £10.20 per hour

and

extra hours at the weekend at £11.80 per hour.

Here are the extra hours he works at the weekend.

SATURDAY	7 am to 10 am
SUNDAY	1 pm to 3 pm

In TOTAL, how much is he paid this week? [4 marks]

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Answer £ 

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[Turn over]



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- 8 Three oranges have masses of 60 g, 70 g and 85 g

Show that their TOTAL mass is between  $\frac{1}{5}$  and  $\frac{1}{4}$  of a kilogram.

[3 marks]

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[Turn over]





**9 For each statement, tick the correct box. [3 marks]**

	<b>ALWAYS TRUE</b>	<b>SOMETIMES TRUE</b>	<b>NEVER TRUE</b>
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**One of the three angles  
of a triangle is 90°**

☐☐☐

**One of the three angles  
of a triangle is obtuse**

☐☐☐

**One of the three angles  
of a triangle is reflex**

☐☐☐





**10(a)** Simplify fully  $p^2 \times p$  [1 mark]

**Answer**

**10(b)** Simplify fully  $3a + 5c - a + 6c$  [2 marks]

**25**

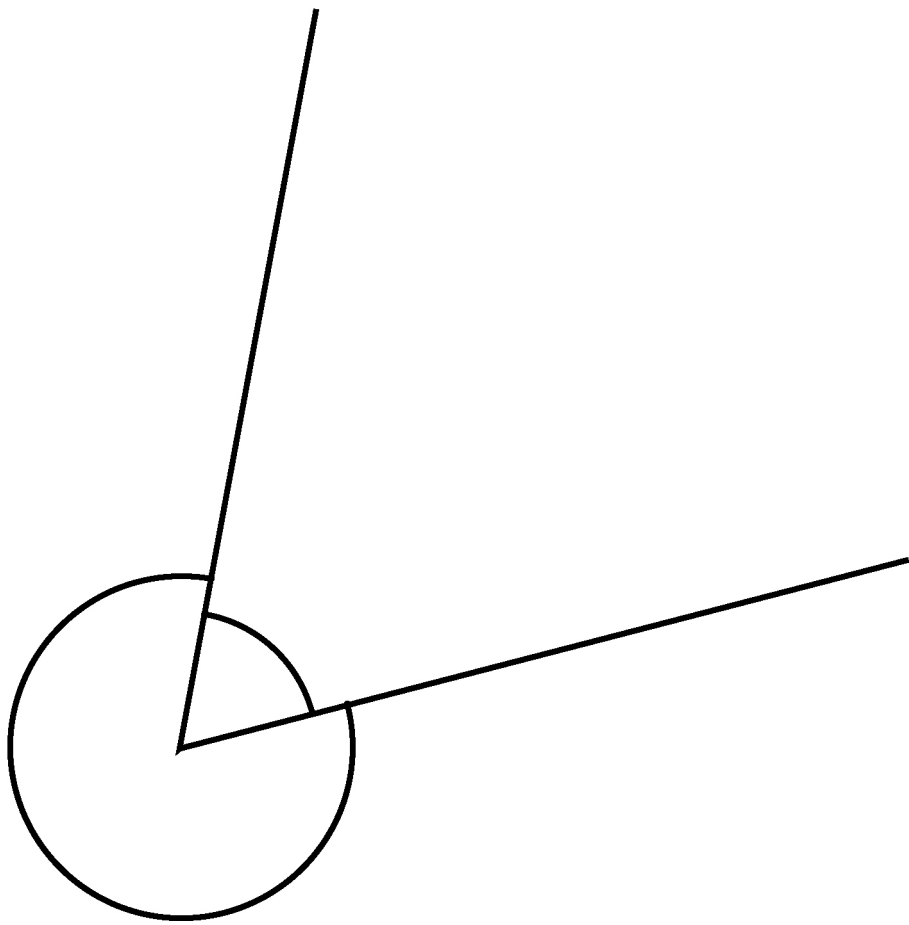
**Answer**

**[Turn over]**

**9**

**11 Two angles around a point are shown.**

**The diagram is not drawn accurately.**



**The angles are in the ratio  $2 : 7$**

**Show that the larger angle is  $280^\circ$   
[2 marks]**

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[Turn over]



12(a)     $c > 4$              $d < 4$              $c - d = 6$

**Work out a possible pair of values for  $c$  and  $d$ . [2 marks]**

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$c =$  \_\_\_\_\_  $d =$  \_\_\_\_\_

**12(b)  $w$  is greater than 1 AND less than 2**

**$x$  is greater than 0 AND less than 1**

$$w + x = 2.6$$

**Work out a possible pair of values for  $w$  and  $x$ . [2 marks]**

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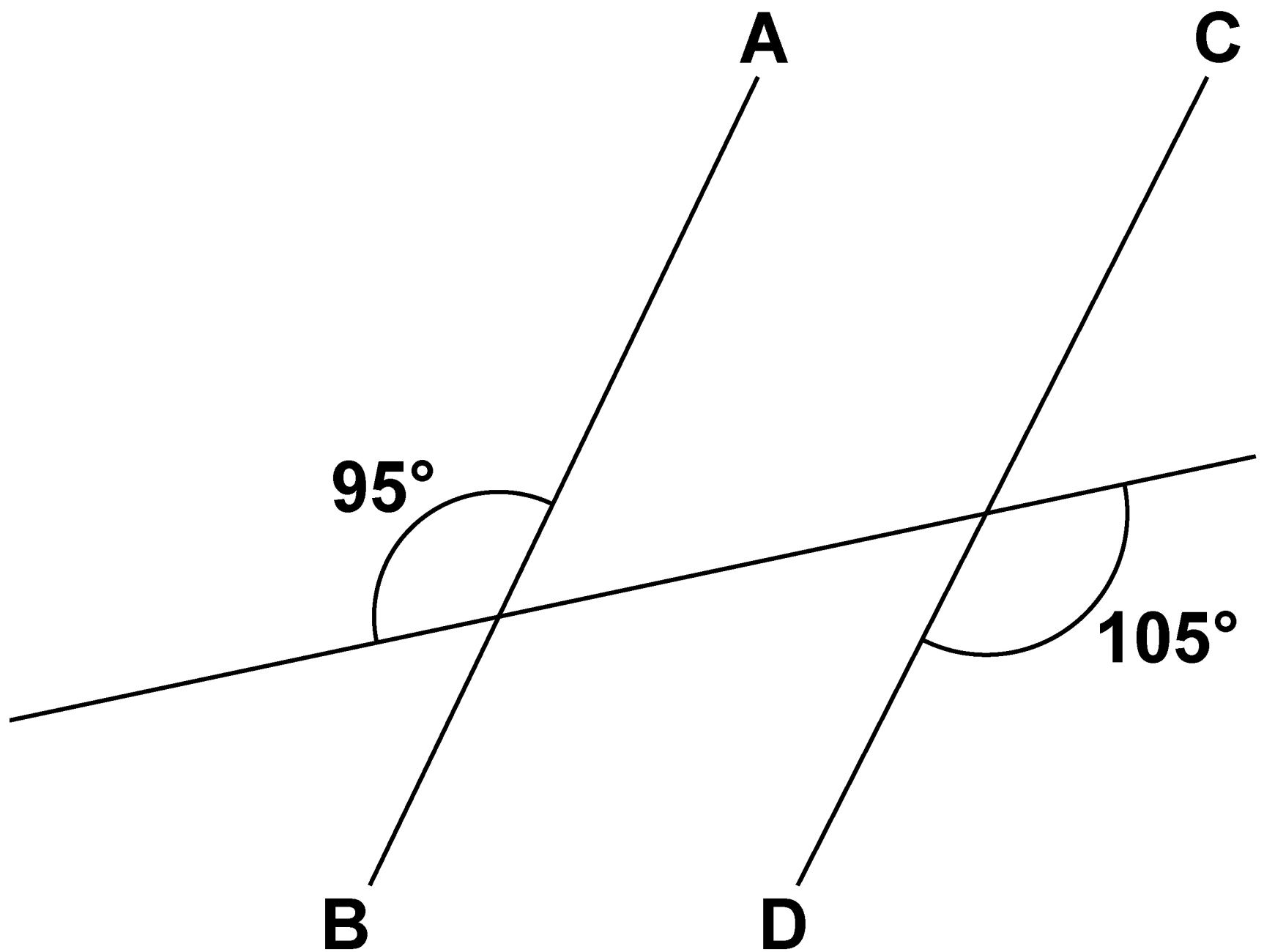
**$w =$  \_\_\_\_\_  $x =$  \_\_\_\_\_**

**[Turn over]**



**13 Here are three straight lines.**

**The diagram is not drawn accurately.**



**Are the lines  $AB$  and  $CD$  parallel?**

**Tick a box.**

☐

**Yes**

☐

**No**

**Show working to support your answer. [2 marks]**

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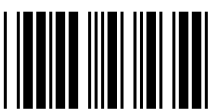
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**[Turn over]**



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# 14 Match the algebra to the correct description.

One has been done for you.  
[3 marks]

$$5a = 20$$

$$4b > 20$$

$$2c + c \equiv 3c$$

$$5d + 7e$$

Identity

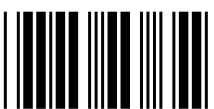
Formula

Equation

Inequality

Expression

[Turn over]



**15 Popcorn is sold in bags.**

**8 small bags have a total mass  
of 496 g**

**5 small bags and 2 large bags have a  
total mass of 638 g**

**Work out the mass of a large bag.  
[4 marks]**

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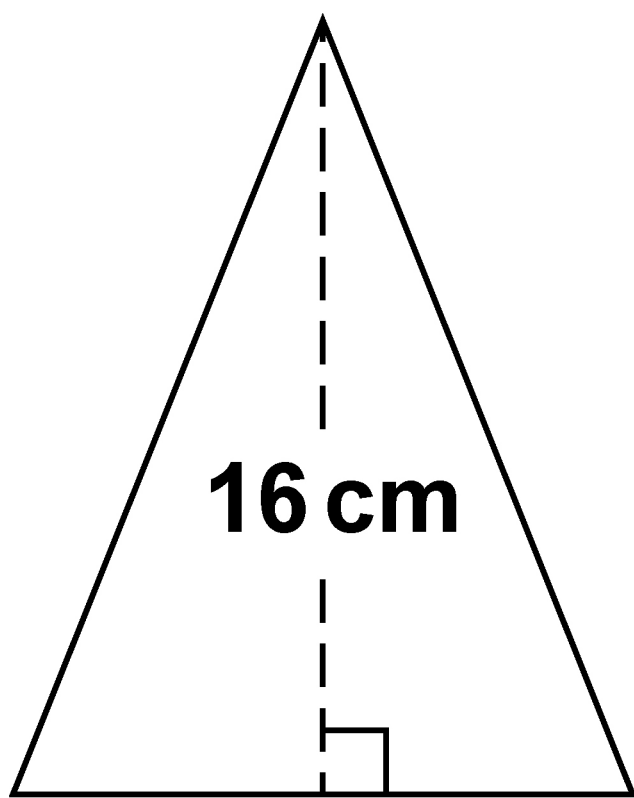
Answer \_\_\_\_\_g

[Turn over]



**16 The rectangle and the triangle have the same area.**

**The diagrams are not drawn accurately.**



**12 cm**



**7.5 cm**

**Length**

**Work out the length of the rectangle.  
[3 marks]**

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

[Turn over]

7



# 17 Match the name to the correct sequence.

One has been done for you.  
[2 marks]

**NAME**

**SEQUENCE**

**Quadratic  
sequence**

**4, 5, 9, 14, 23...**

**Linear  
sequence**

**−3, 1, 5, 9, 13...**

**Fibonacci-type  
sequence**

**−4, −1, 1, 5, 12...**

**8, 11, 16, 23, 32...**



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**[Turn over]**



- 18 The number of hedgehogs in England is expected to REDUCE by 4% each year.**

**Assume there are now 1 000 000 hedgehogs in England.**

**Work out the expected number of hedgehogs in England after FIVE years.**

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

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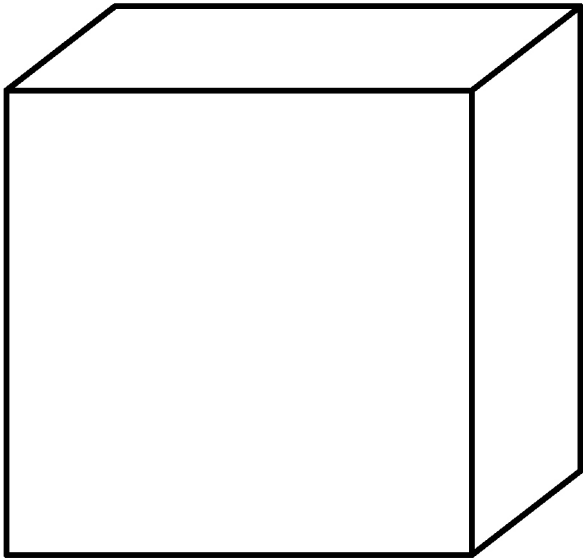
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Answer \_\_\_\_\_

[Turn over]

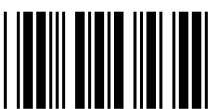
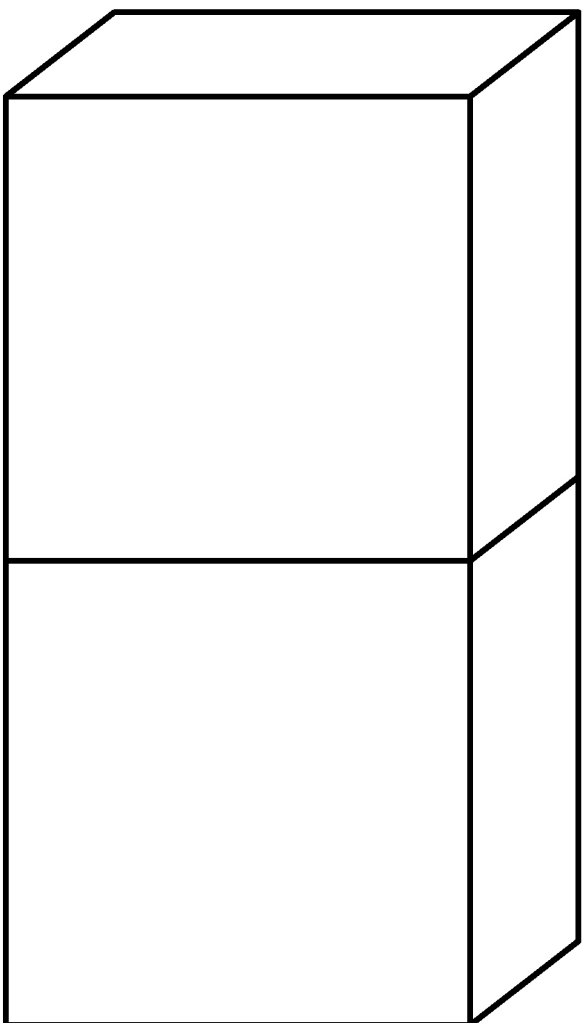
**19 Here is cuboid A.**

**A**



**Cuboid B is made from TWO of cuboid A.**

**B**



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**[Turn over]**



**volume of A : volume of B = 1 : 2**

**Matthew says,**

**“surface area of A : surface area of B must be 1 : 2 because B is made of 2 of A.”**

**Is Matthew correct?**

**Tick ONE box.**

☐

**Yes**

☐

**No**

☐

**Cannot tell**



**Give a reason for your answer.**  
**[2 marks]**

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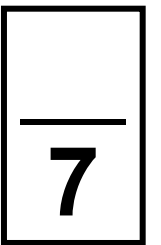
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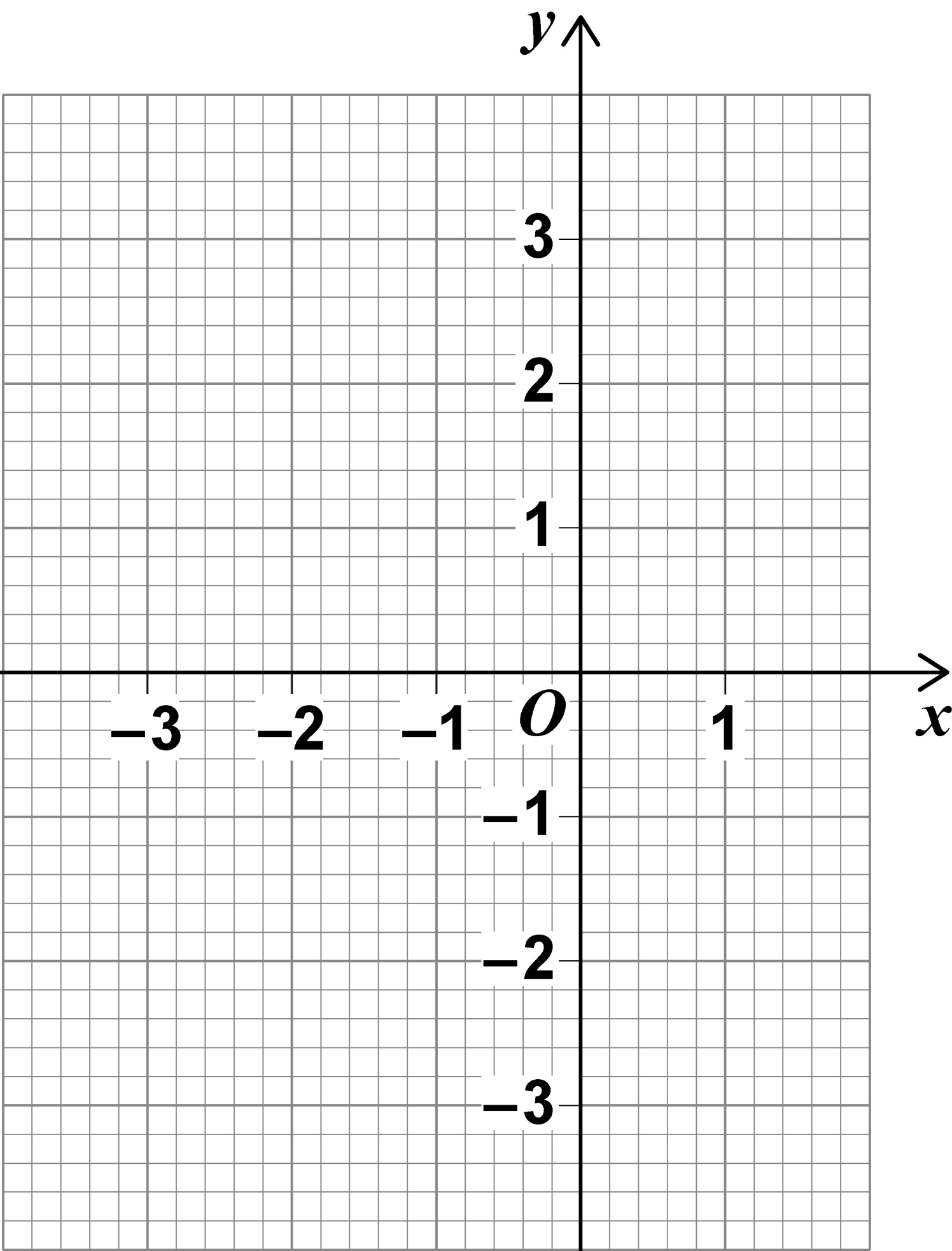
**[Turn over]**



- 20 (a) Complete the table of values for  $y = x^2 + 2x$  [2 marks]**

$x$	$-3$	$-2$	$-1$	$0$	$1$
$y$	$3$		$-1$	$0$	

- 20 (b) On the opposite page, draw the graph of  $y = x^2 + 2x$  for values of  $x$  from  $-3$  to  $1$  [2 marks]**



[Turn over]



**21 Jing has £2450**

**She saves some and gives the rest to her four brothers.**

**money saved : money given to brothers = 2 : 5**

**She gives each of her FOUR brothers the SAME amount.**

**Does each brother receive more than £430 ?**

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

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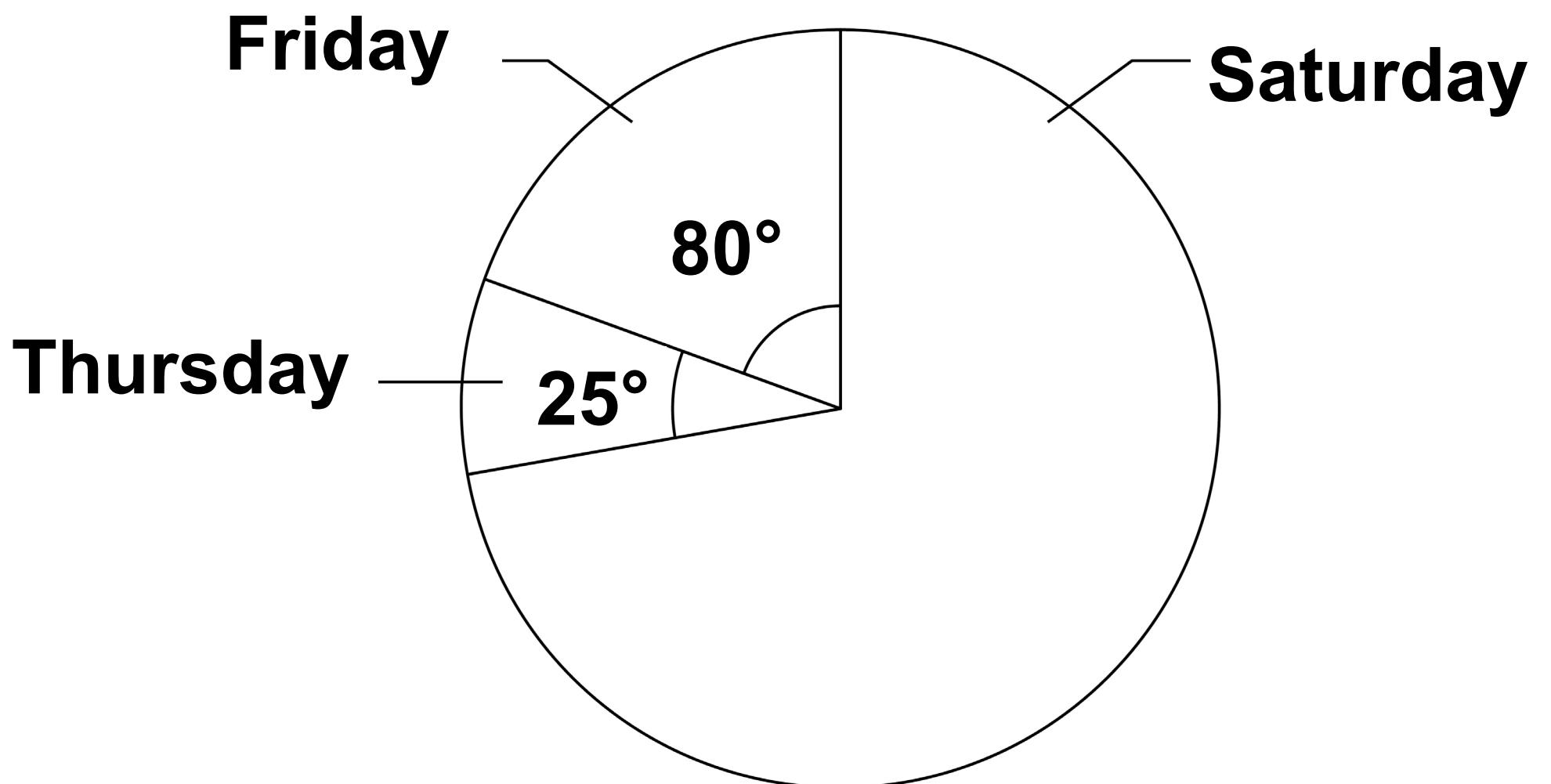
[Turn over]

8



- 22** The pie chart shows information about people at a fair during three days.

**The diagram is not drawn accurately.**



**There were 132 MORE people on Friday than on Thursday.**

**Work out the number of people on Saturday. [3 marks]**

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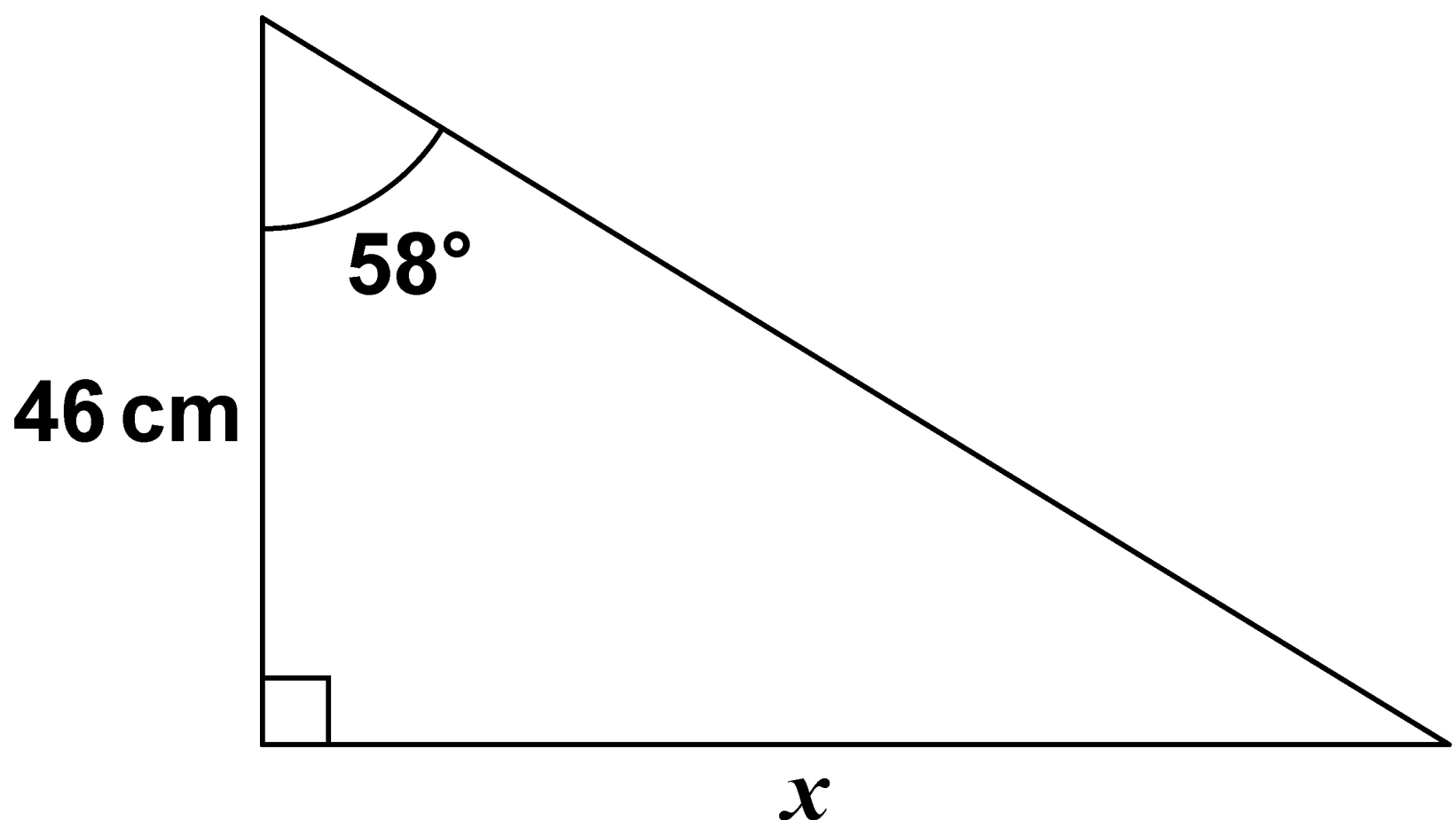
Answer \_\_\_\_\_

[Turn over]



- 23 Use trigonometry to work out the value of  $x$ . [3 marks]**

**The diagram is not drawn accurately.**



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$x =$  \_\_\_\_\_ **cm**

[Turn over]

6



**24** Millie is estimating the value of

$$\frac{1}{\left(\sqrt[3]{8.34}\right)^2 \times 10.21}$$

**She rounds each decimal number to 1 significant figure.**

**24 (a) Work out Millie's estimate.**

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

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

**24(b) Millie says,**

**“My estimate must be more than the exact value.”**

**WITHOUT WORKING OUT THE EXACT VALUE, give a reason how she can know this. [1 mark]**

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**[Turn over]**



**25(a) Factorise  $x^2 + 8x + 15$  [2 marks]**

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

**25(b) Write down the TWO solutions of  $(y + 2)(y - 4) = 0$  [1 mark]**

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

**END OF QUESTIONS**

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<b>6</b>





**Additional page, if required.**  
**Write the question numbers in the left-hand margin.**


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**Write the question numbers in the left-hand margin.**


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**Write the question numbers in the left-hand margin.**


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For Examiner's Use	
Pages	Mark
4–7	
8–11	
13–15	
16–21	
23–25	
26–29	
30–33	
34–37	
38–45	
46–49	
50–53	
54–56	
TOTAL	

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