

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Monday 11 November 2019 – Afternoon**

**GCSE (9–1) Mathematics**

**J560/03 Paper 3 (Foundation Tier)**

**Time allowed: 1 hour 30 minutes  
plus your additional time allowance**

**YOU MAY USE:**

**a scientific or graphical calculator  
geometrical instruments  
tracing paper**

**Please write clearly in black ink.**

**Centre number**

--	--	--	--	--

**Candidate number**

--	--	--	--

**First name(s)**

\_\_\_\_\_

**Last name**

\_\_\_\_\_

**READ INSTRUCTIONS OVERLEAF**



## **INSTRUCTIONS**

**Use black ink. You may use an HB pencil for graphs and diagrams.**

**Answer ALL the questions.**

**Read each question carefully before you start to write your answer.**

**Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.**

**Write your answer to each question in the space provided.**

**If additional space is required, use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.**

## **INFORMATION**

**The total mark for this paper is 100.**

**The marks for each question are shown in brackets [ ].**

**Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.**

**Answer ALL the questions.**

**1 (a) Here are some types of number.**

**An even  
number**

**An odd  
number**

**A prime  
number**

**A square  
number**

**A cube  
number**

**From the list, write down the type of number being described.**

**(i) A number that does NOT divide exactly by 2.**

\_\_\_\_\_ **[1]**

**(ii) A number that has no factors except itself and 1.**

\_\_\_\_\_ **[1]**

**(b) (i) Write down all the multiples of 4 between 21 and 29.**

**(b)(i) \_\_\_\_\_ [1]**

**(ii) Write down a common multiple of 4 and 6.**

**(ii) \_\_\_\_\_ [1]**

**(c) Insert brackets to make this calculation correct.**

$$4 - 1 \times 2 = 6 \quad [1]$$

**(d) Write 7% as a fraction.**

**(d) \_\_\_\_\_ [1]**

**2 Work out.**

$$1.52 \text{ kg} + 80 \text{ g}$$

**Give your answer in kilograms.**

\_\_\_\_\_ kg [2]

**3 (a) Round 32 629 to the nearest thousand.**

(a) \_\_\_\_\_ [1]

**(b) Round 32 629 to 1 significant figure.**

(b) \_\_\_\_\_ [1]

**4 A circle has radius 5 cm.**

**(a) Work out the circumference of the circle.**

**(a) \_\_\_\_\_ cm [2]**

**(b) Work out the area of the circle.**

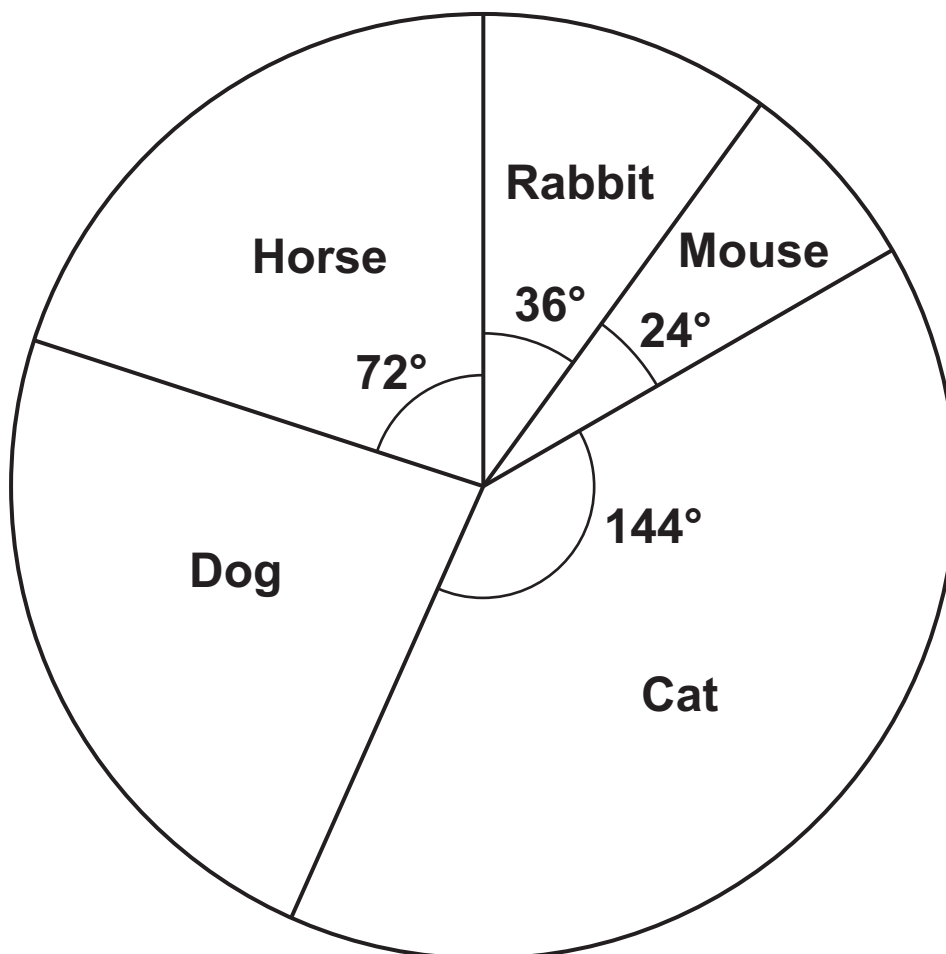
**(b) \_\_\_\_\_ cm<sup>2</sup> [2]**

- 5 Dan thinks of a number.  
He adds 3 and divides the result by 2.  
His answer is 16.

What number is Dan thinking of?

\_\_\_\_\_ [2]

- 6 30 students each own one pet.  
The pie chart shows the proportion of each type of pet owned by the 30 students.

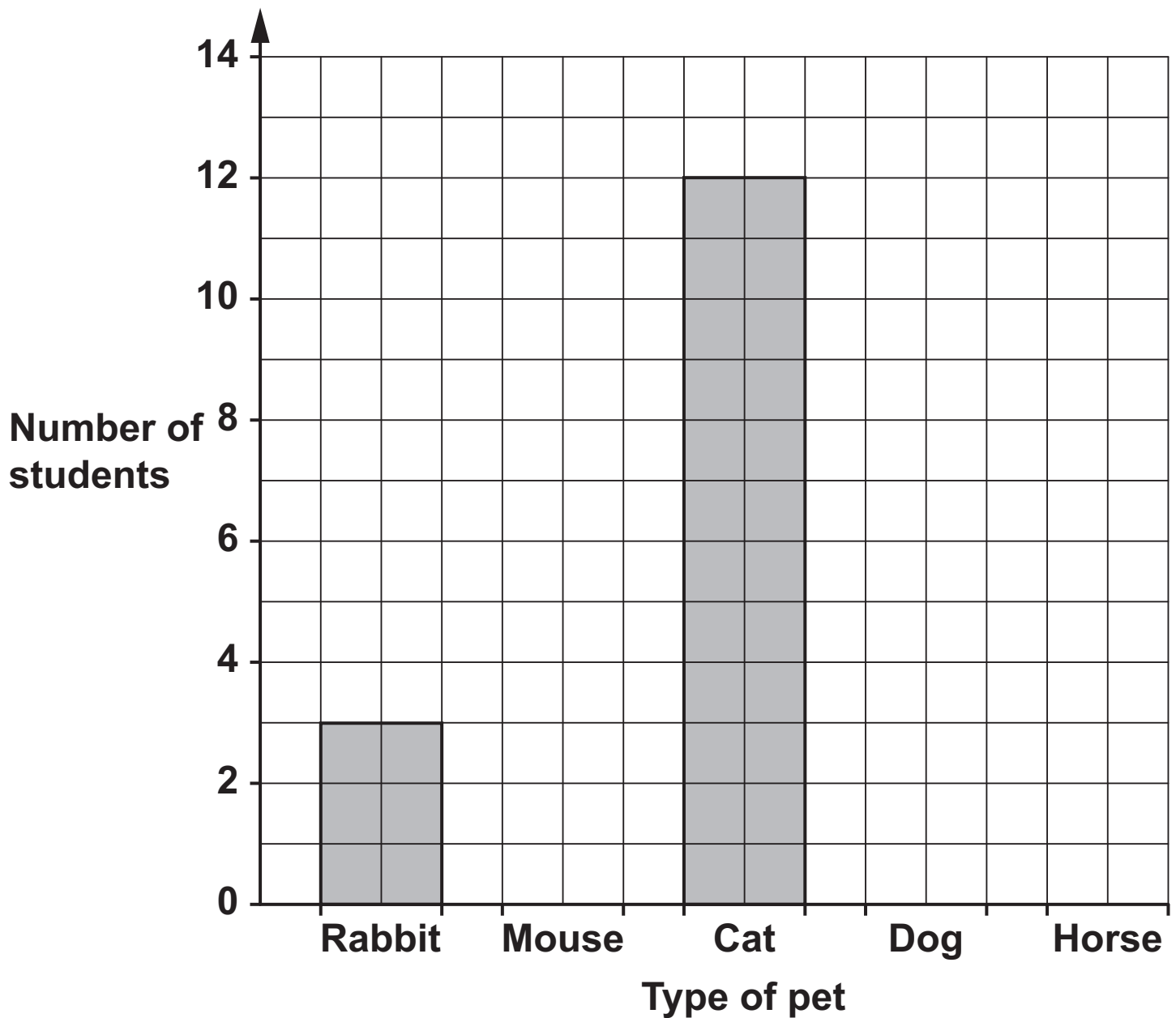


(a) Which type of pet is the mode?

(a) \_\_\_\_\_ [1]



(b) Use the information in the pie chart to complete this bar chart. [3]



- 7 Jenny has a five-sided BIASED spinner.  
The sectors are coloured red, blue, green, yellow and white.  
She spins the spinner 100 times.**

**The table shows the number of times the spinner lands on each colour.**

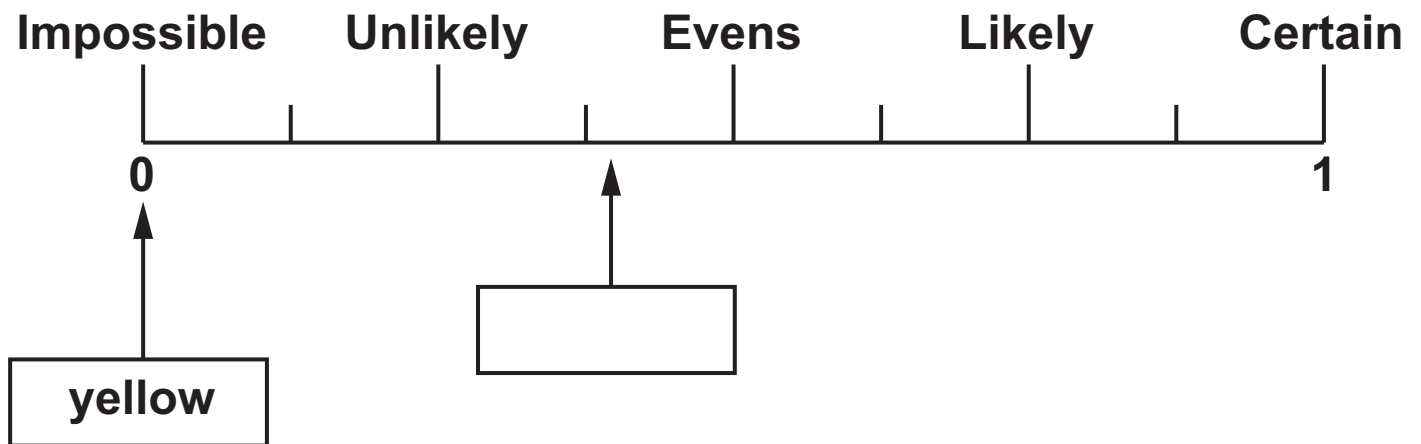
<b>Colour</b>	<b>Frequency</b>
<b>Red</b>	<b>28</b>
<b>Blue</b>	<b>38</b>
<b>Green</b>	<b>6</b>
<b>Yellow</b>	<b>0</b>
<b>White</b>	<b>28</b>
<b>Total</b>	<b>100</b>

**Jenny uses her data to estimate the probability of the spinner landing on each colour.**

- (a) Write down Jenny's estimate for the probability of landing on red.**

**(a) \_\_\_\_\_ [1]**

**(b) Jenny then writes in some of the colours on this probability scale.**



- (i) Write the correct colour in the box. [1]
- (ii) Explain why Jenny's estimate for the probability of landing on yellow cannot be the actual probability.

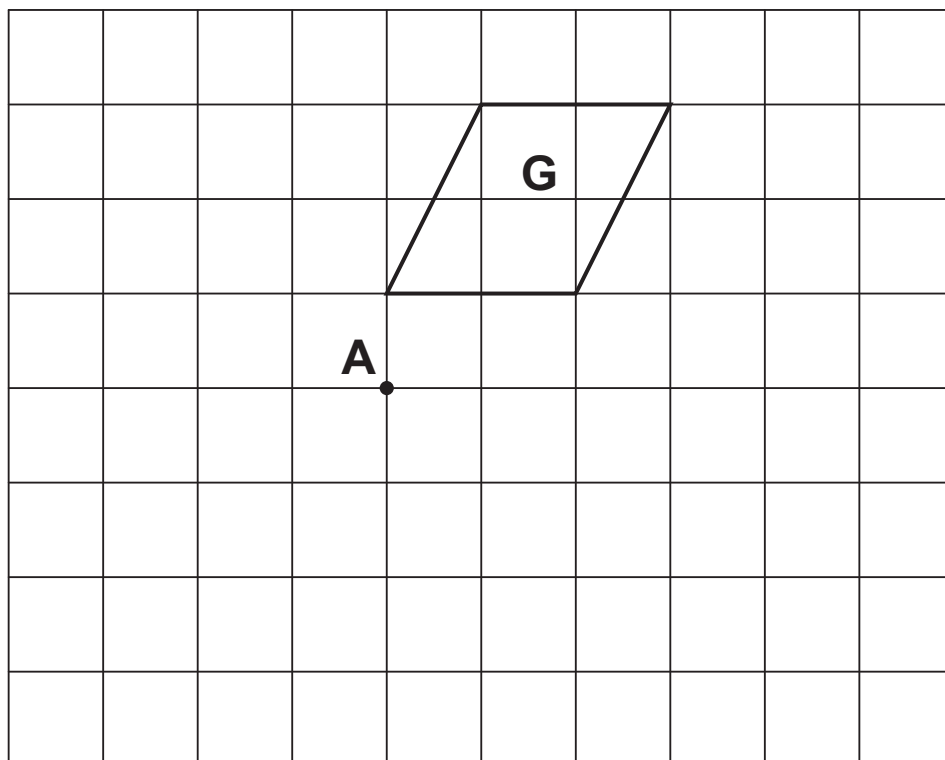
---

---

---

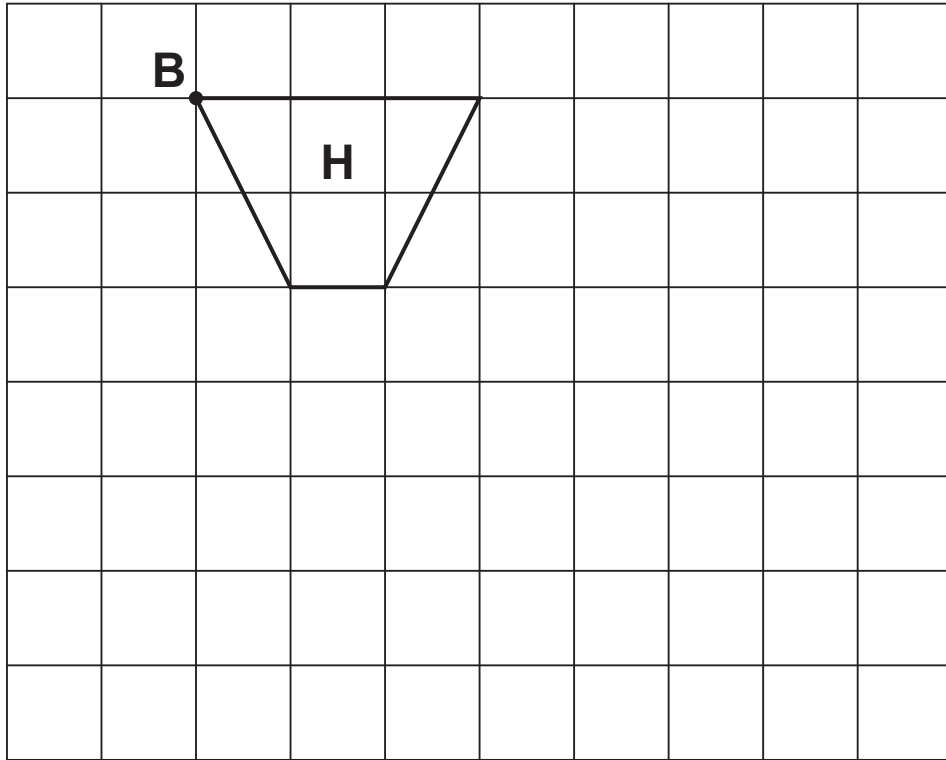
[1]

**8 (a) Shape G is drawn on the grid.**



**Rotate shape G by  $180^\circ$  about the point A. [2]**

**(b) Shape H is drawn on the grid.**



**Enlarge shape H with scale factor 2 and the centre of enlargement at point B. [2]**

- 9 Tom buys a radio for £40.  
Later he sells it and makes a profit of 20%.**

**Tom says**

**The ratio of the price I paid for the radio to the price I sold the radio is 5 : 6.**

**Show that Tom is correct. Use the space below. [3]**

**BLANK PAGE**

**10 Nada is planning the colour scheme for her bedroom.**

**The colour of her carpet can be blue (B), grey (G) or red (R).**

**The walls can be painted yellow (Y), white (W) or pink (P).**

- (a) Complete the table to show all of the possible colour combinations she can make.  
You may not need all the rows. [2]**

CARPET	WALLS
B	Y



- (b) Explain why it would NOT be mathematically correct to find the probability that Nada decides on a grey carpet and pink walls using this formula.

$$\frac{1}{\text{the total number of colour combinations}}$$

---

---

[1]

**11 Multiply out.**

**(a)  $3(x - 2)$**

**(a) \_\_\_\_\_ [1]**

**(b)  $2a(a + b)$**

**(b) \_\_\_\_\_ [2]**

**12 (a) Find the value of**

**(i)  $\sqrt[3]{216}$ ,**

**(a)(i) \_\_\_\_\_ [1]**

**(ii)  $2^8$ .**

**(ii) \_\_\_\_\_ [1]**

**(b) The cube of 3 is added to the square root of 7.**

**Put a ring around the correct statement. [1]**

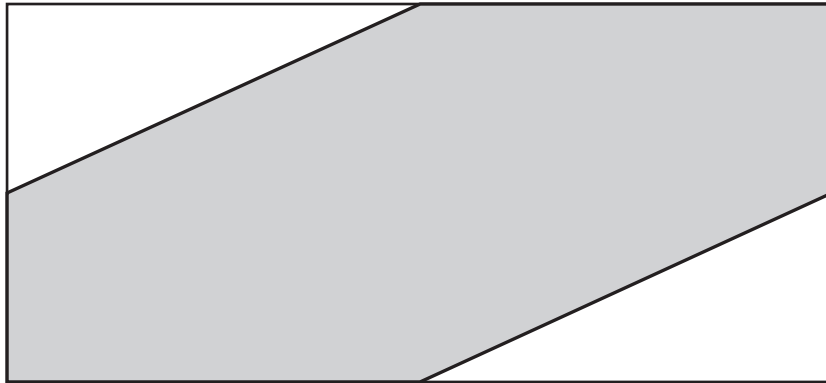
$\sqrt[3]{3} + 7^2$

$3^3 + 7^2$

$3^3 + \sqrt{7}$

$\sqrt[3]{3} + \sqrt{7}$

- 13 The midpoints of the sides of a rectangle are joined by straight lines as shown.**

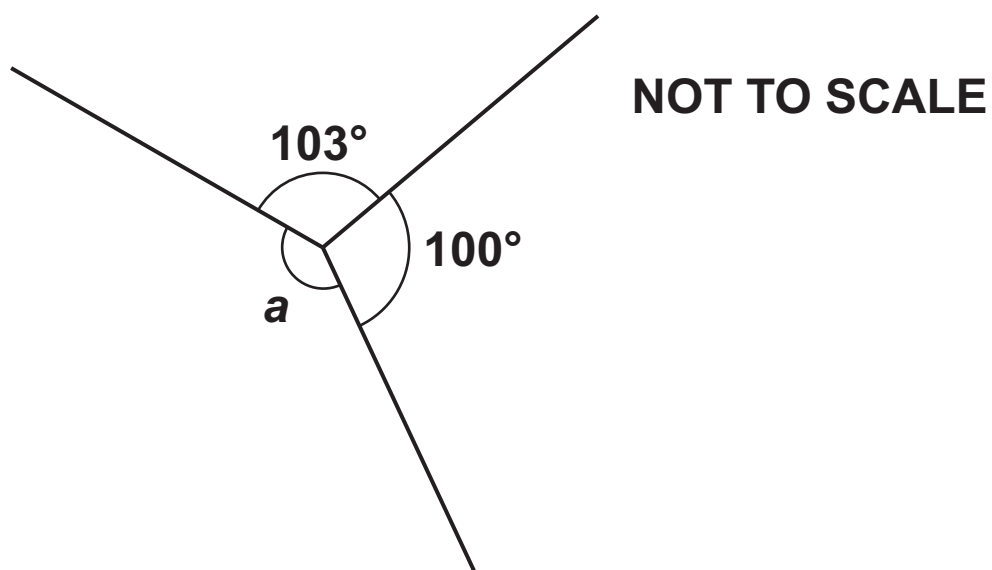


**Work out the percentage of the rectangle that is shaded.**

\_\_\_\_\_ % [4]

**BLANK PAGE**

14 (a) Three lines meet at a point.



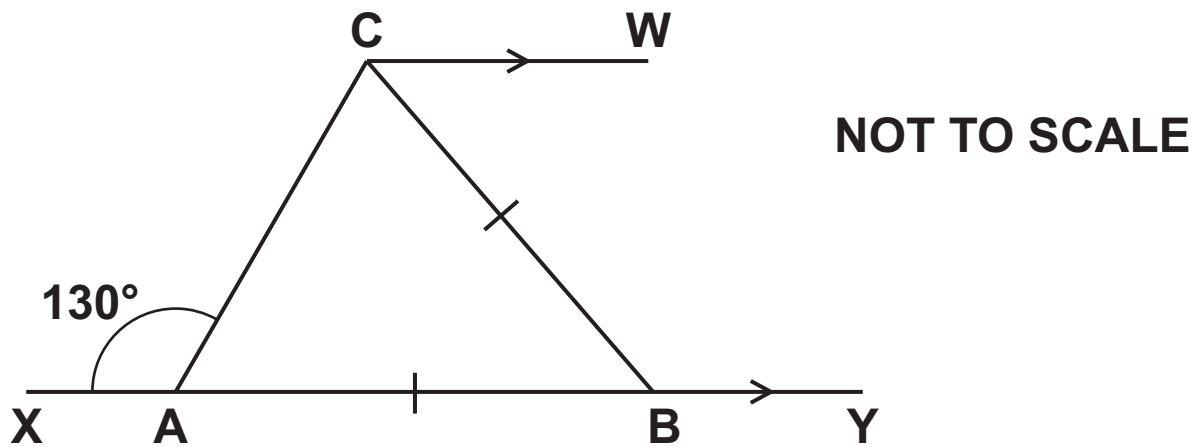
Work out the size of angle  $a$ .

(a)  $a =$  \_\_\_\_\_  $^\circ$  [2]

(b) XY and CW are parallel lines.

$AB = CB$ .

Angle  $CAX = 130^\circ$ .



(i) Complete this sentence.

Angle  $CAB = 50^\circ$  because \_\_\_\_\_

\_\_\_\_\_ [1]



- (ii) Work out angle BCW.  
Give a reason for each angle you work out.

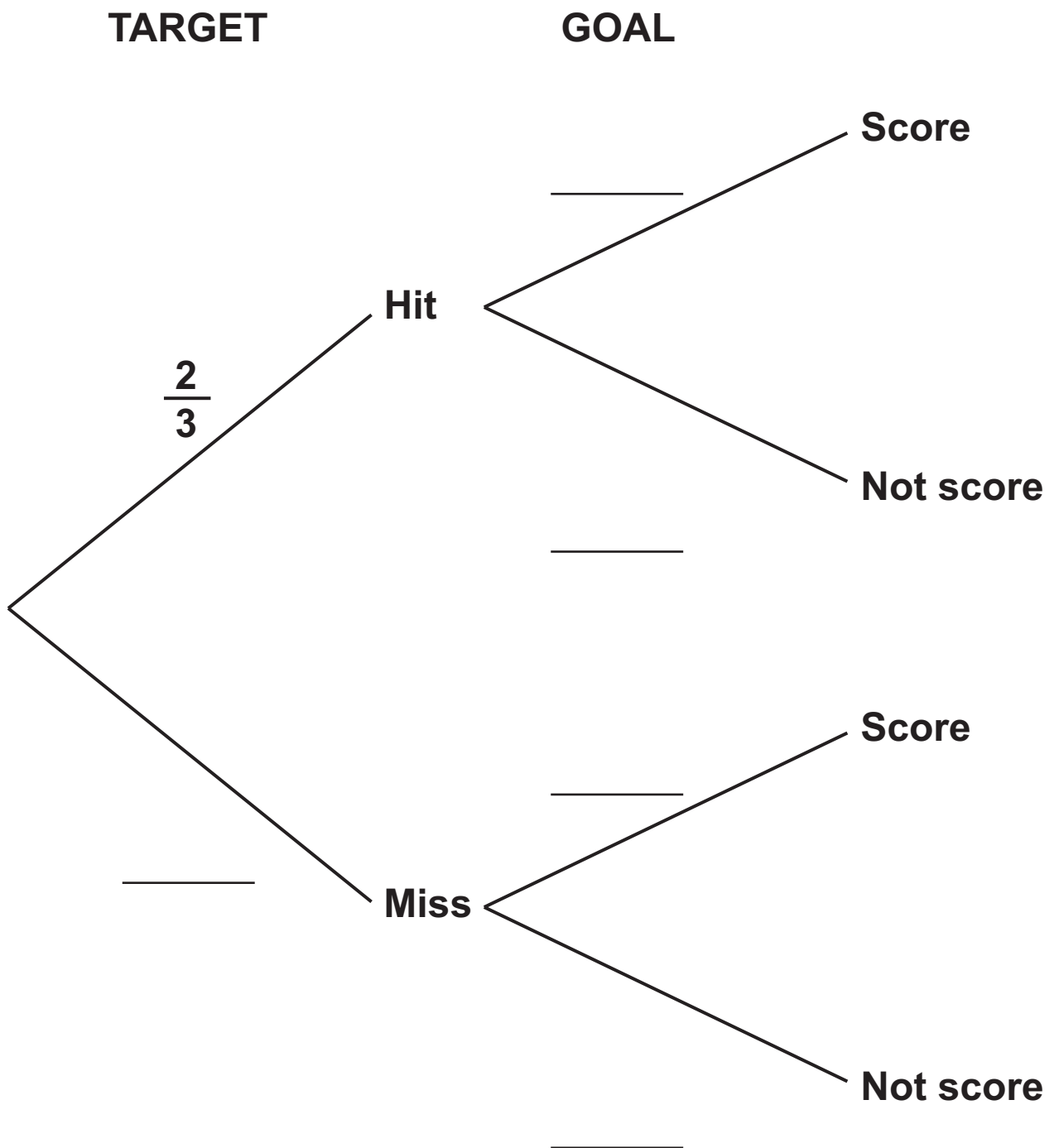
(b)(ii) \_\_\_\_\_° [4]

**15 Ryan shoots an arrow at a target. He then kicks a ball at a goal.**

**The probability that Ryan hits the target is  $\frac{2}{3}$ .**

**The probability that Ryan scores a goal is  $\frac{3}{5}$ .**

(a) Complete the tree diagram. [2]



**(b) Find the probability that Ryan**

**(i) misses the target and does not score a goal,**

**(b)(i) \_\_\_\_\_ [2]**

**(ii) either hits the target or scores a goal or both.**

**(ii) \_\_\_\_\_ [2]**

**16 Solve the simultaneous equations.**

$$2x - y = 7$$

$$2x + y = 5$$

$$x = \underline{\hspace{4cm}}$$

$$y = \underline{\hspace{4cm}} [3]$$

**BLANK PAGE**

- 17 Two model cars, A and B, are in a race.  
They start together on the starting line.  
Assume each car travels at a constant speed.**

**Car A takes 30 seconds to complete each lap of the track.**

**Car B takes a whole number of seconds to complete each lap of the track.**

**The two cars next cross the starting line together 150 seconds after the start of the race.**

**Find the FOUR possible times that car B could take to complete one lap.**

**You may find this information helpful.**

$$150 = 2 \times 3 \times 5 \times 5$$

$$30 = 2 \times 3 \times 5$$



\_\_\_\_\_ seconds [5]

- 18 (a) Write down the multiplier for an increase of 140%.  
Give your answer as a decimal.

(a) \_\_\_\_\_ [1]

- (b) Ali invests £1500 in October.  
The investment increases in value by 10% in November.  
It then decreases in value by 20% in December.

Ali says

$10\% - 20\% = -10\%$ , so the £1500 has lost exactly 10% of its value.

- (i) Explain what Ali has done wrong.

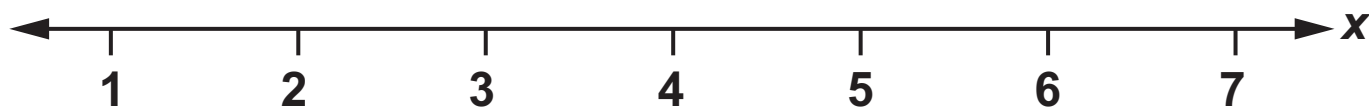
\_\_\_\_\_  
\_\_\_\_\_ [1]

**(ii) Work out the correct percentage loss.**

\_\_\_\_\_ % [5]

**19 Solve  $3x - 5 \geq 10$ .**

**Show your solution on the number line. [4]**



**20 Amrit's income is 32% more than Bethan's income.  
Amrit and Bethan's combined income is £54 868.**

**Calculate Amrit's income.**

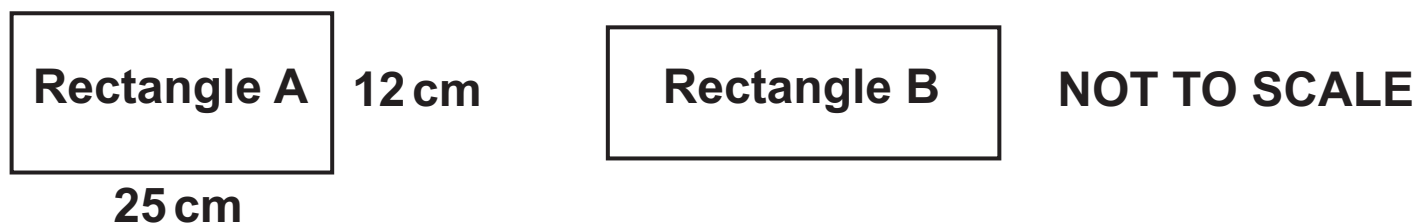
**£ \_\_\_\_\_ [5]**

- 21 Jacob, Amelie and Reuben each roll a fair six-sided dice.  
What is the probability that all three roll a number less than 3?**

**Give your answer as a fraction in its simplest form.**

\_\_\_\_\_ **[3]**

**22 The diagram shows two rectangles, A and B.**



**Rectangle A has a width of 25 cm and a height of 12 cm.**

**The width of rectangle B is three times the height of rectangle B.**

**The area of rectangle A is equal to the area of rectangle B.**

**Find the perimeter of rectangle B.**

- 23 Kay invests £1500 in an account paying 3% COMPOUND interest per year.  
Neil invests £1500 in an account paying  $r\%$  SIMPLE interest per year.**

**At the end of the 5th year, Kay and Neil's accounts both contain the same amount of money.**

**Calculate  $r$ .**

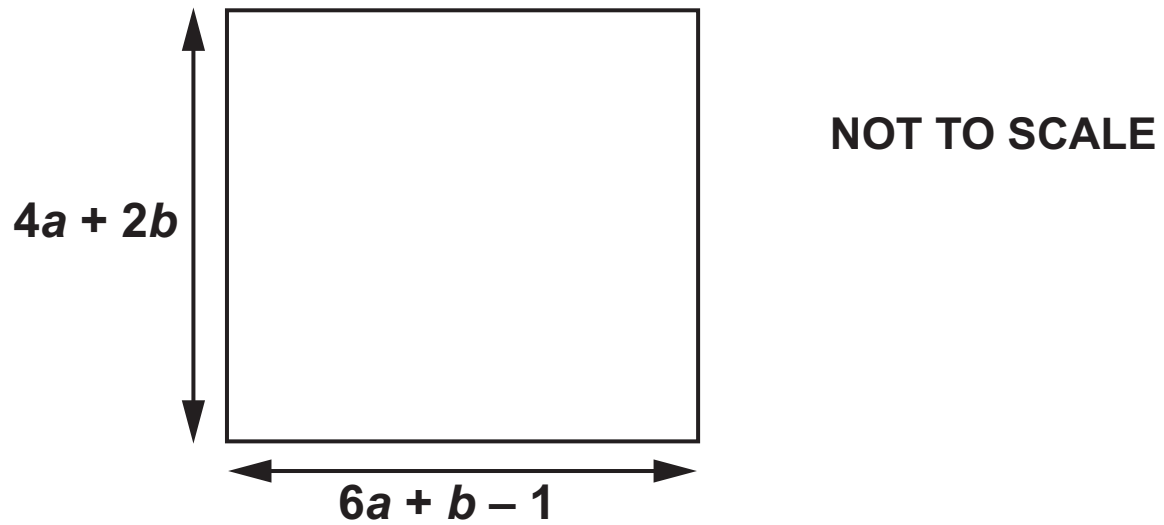
**Give your answer correct to 1 decimal place.**



$$r = \underline{\hspace{2cm}} [6]$$

**24** In this question, all lengths are in centimetres.

Here is a square.



Find the length of one side of the square when  $b = 4$ .

\_\_\_\_\_ cm [6]

**END OF QUESTION PAPER**

### ADDITIONAL ANSWER SPACE

**If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).**

[illegible]

[illegible]



**BLANK PAGE**



## **Copyright Information**

**OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.**

**If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.**

**For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.**

**OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.**