

**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**

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**Candidate number**

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**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.**

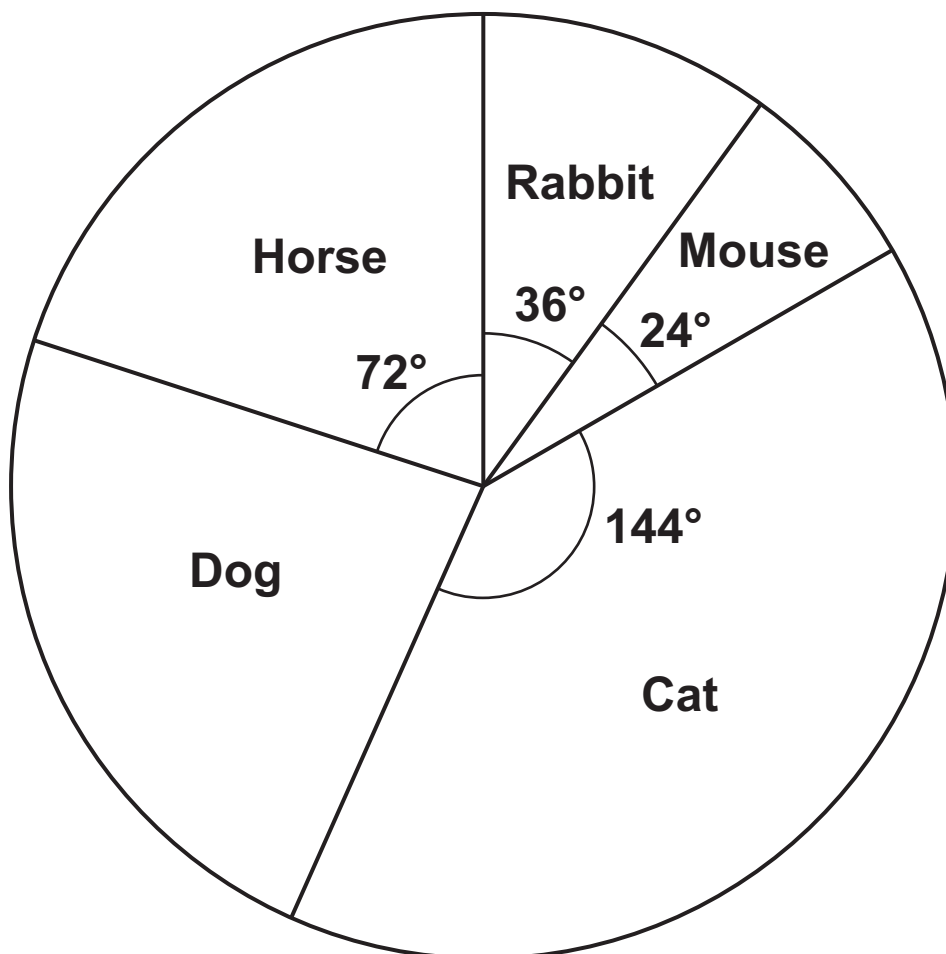
**(b) \_\_\_\_\_ cm<sup>2</sup> [2]**

- 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.

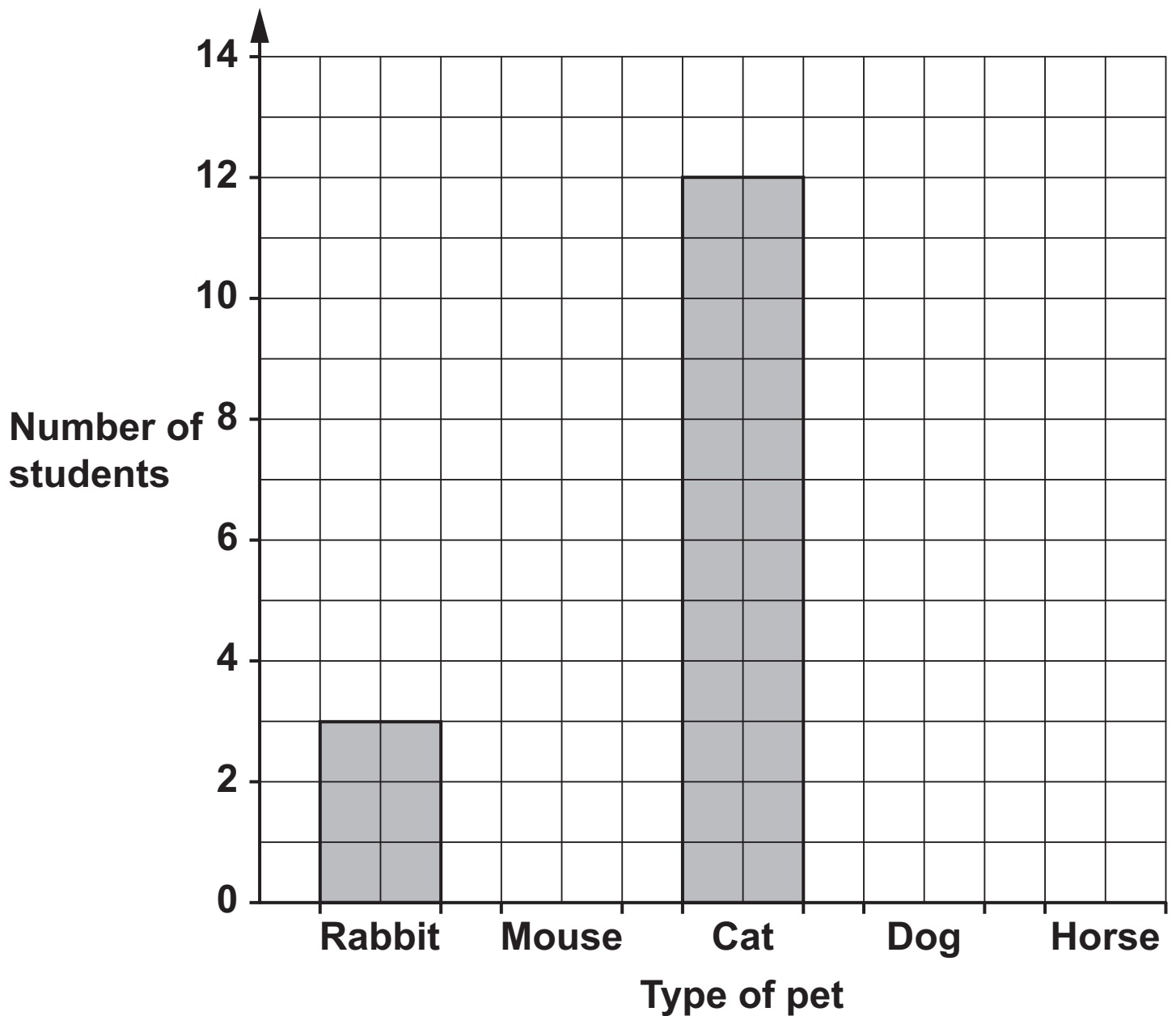


(a) Which type of pet is the mode?

(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.**

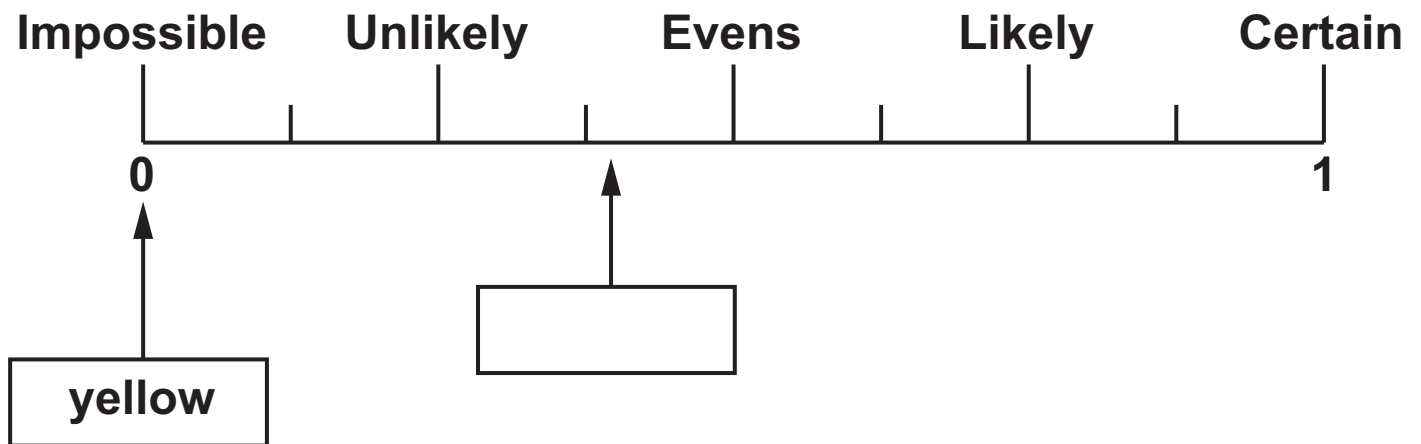
<b>Colour</b>	<b>Frequency</b>
<b>Red</b>	<b>28</b>
<b>Blue</b>	<b>38</b>
<b>Green</b>	<b>6</b>
<b>Yellow</b>	<b>0</b>
<b>White</b>	<b>28</b>
<b>Total</b>	<b>100</b>

**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.

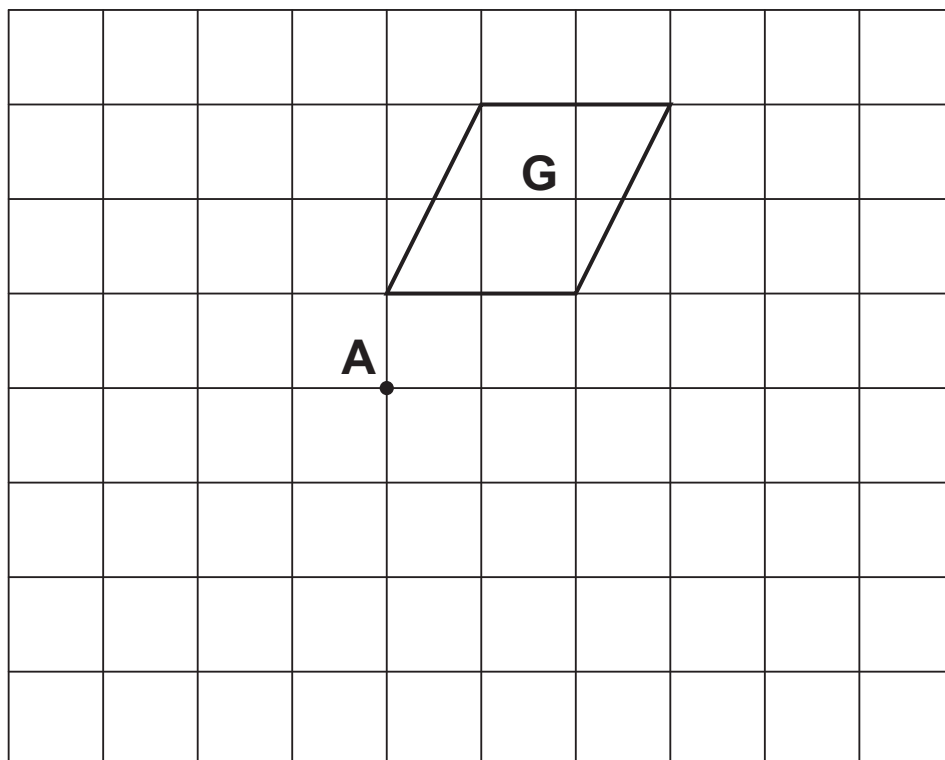
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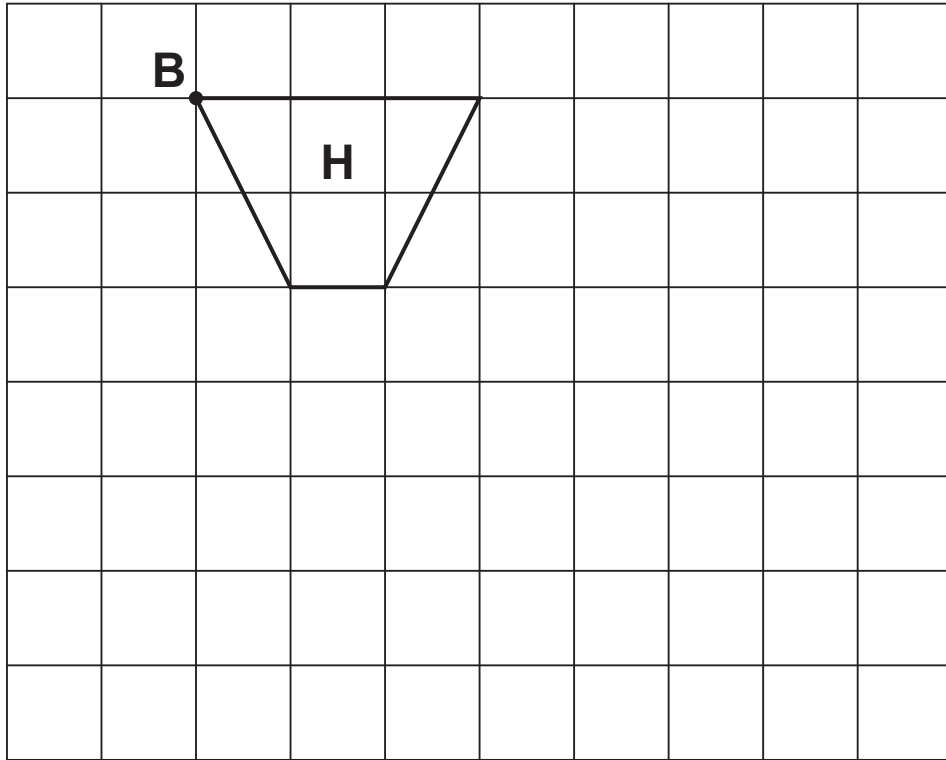
[1]

**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]

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**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.

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

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[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]**

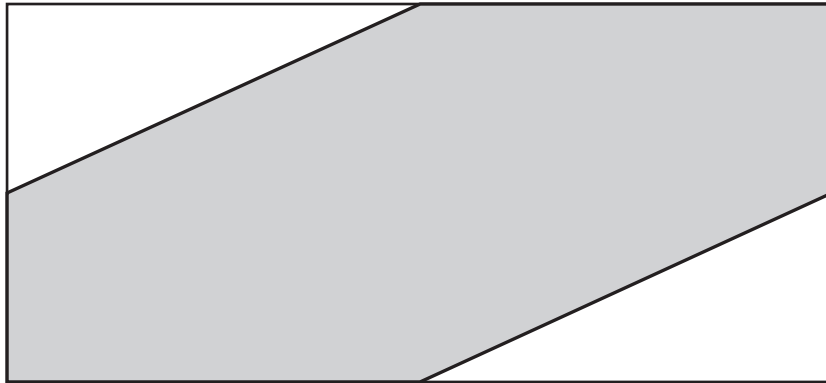
$\sqrt[3]{3} + 7^2$

$3^3 + 7^2$

$3^3 + \sqrt{7}$

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

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

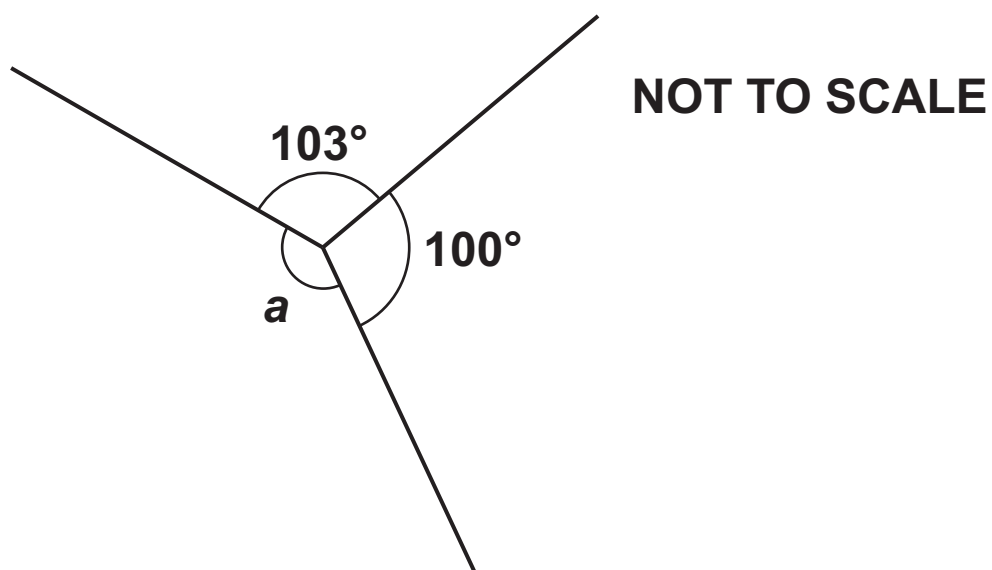


**Work out the percentage of the rectangle that is shaded.**

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

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14 (a) Three lines meet at a point.



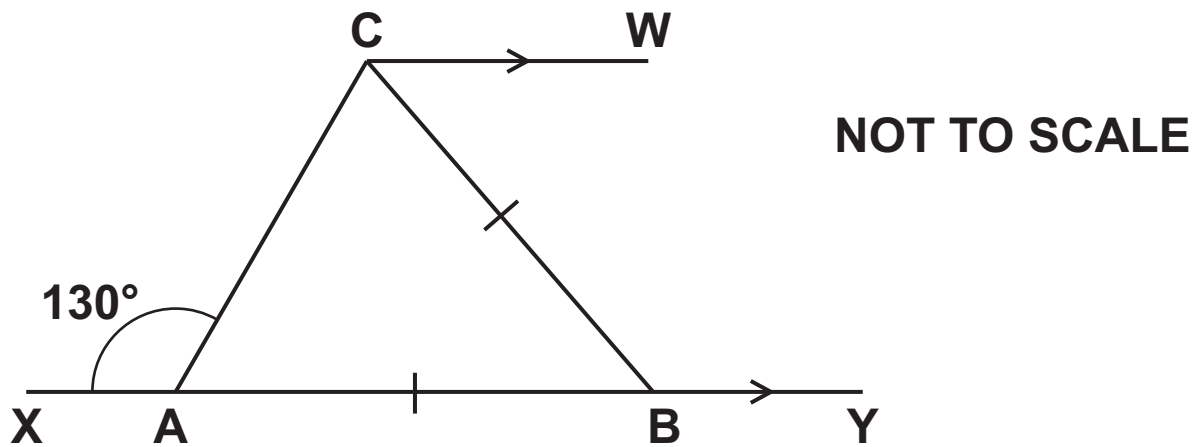
Work out the size of angle  $a$ .

(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.

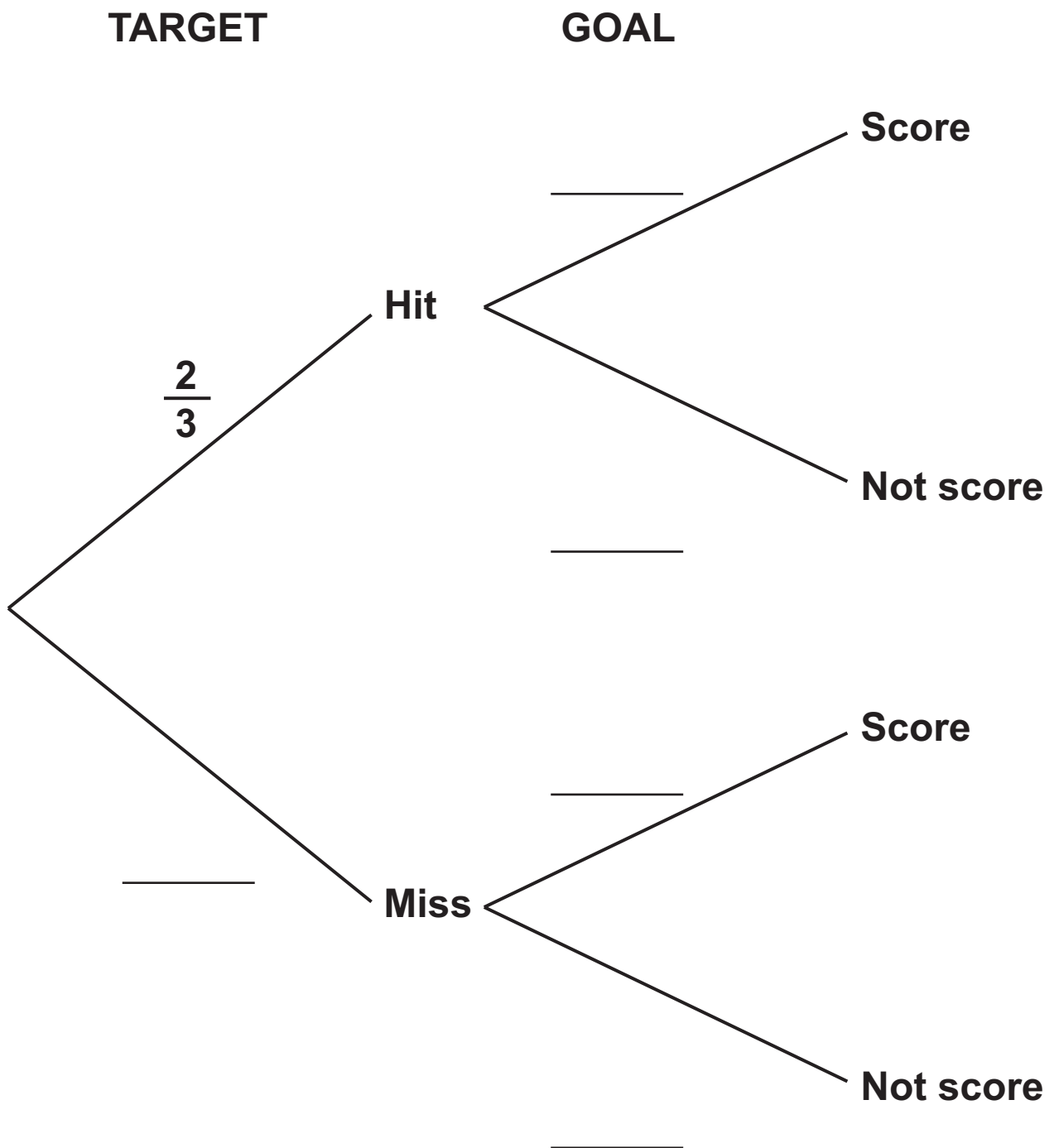
(b)(ii) \_\_\_\_\_° [4]

**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.**

$$2x - y = 7$$

$$2x + y = 5$$

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

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

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- 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  $r$ .**

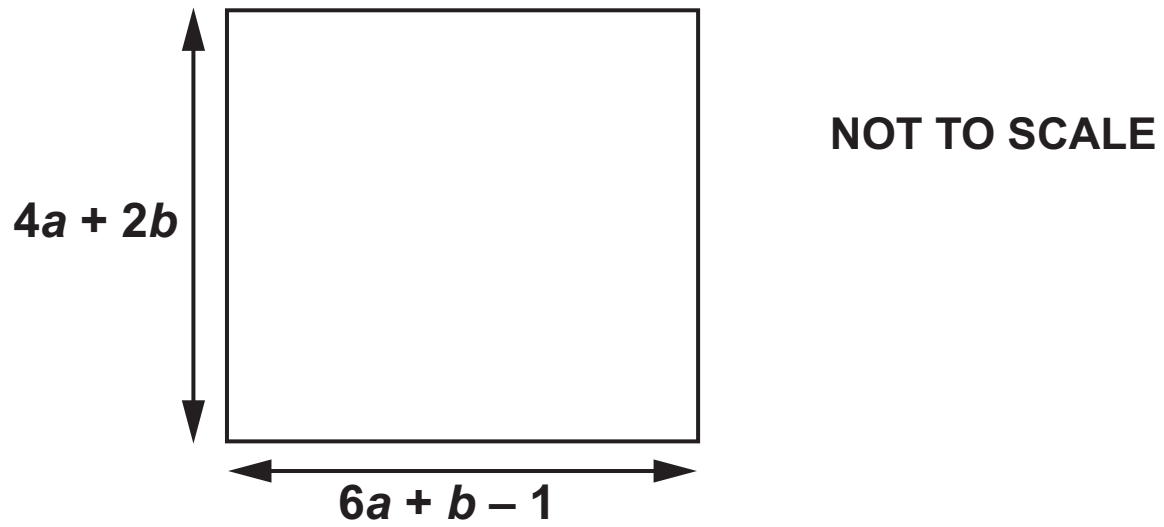
**Give your answer correct to 1 decimal place.**



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

**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).**

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