

GCSE – NEW

3300U40-1

MATHEMATICS

UNIT 2:

CALCULATOR – ALLOWED

INTERMEDIATE TIER

TUESDAY,

20 JUNE 2017 – AFTERNOON

1 hour 45 minutes

**(plus your additional
time allowance)**

<p>A CALCULATOR WILL BE REQUIRED FOR THIS PAPER</p>
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For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	3	
3.	2	
4.	3	
5.	2	
6.	4	
7.	5	
8.	4	
9.	3	
10.	6	
11.	4	
12.	5	
13.	4	
14.	3	
15.	3	
16.	3	
17.	5	
18.	5	
19.	2	
20.	2	
21.	5	
Total	80	

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

A spare Diagram Booklet.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3.14 or use the π button on your calculator.

(Turn over)

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part – question.

In question 10, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

1. (a) Calculate **39%** of **£576**

[2 marks]

(b) Calculate $\frac{3}{7}$ of **100**

**Give your answer correct to the
nearest whole number.**

[2 marks]

(Turn over)

Question 1 continued

1. (c) How many quarters are there in 10?

[1 mark]

(d) What FRACTION is equal to 50% of $\frac{1}{6}$?

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (e) Circle the fraction that is a recurring decimal.

$\frac{21}{35}$	$\frac{10}{12}$	$\frac{17}{68}$	$\frac{15}{24}$	$\frac{51}{170}$
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[1 mark]

(Turn over)

**2. Look at the table for Question 2
in the separate Diagram Booklet.**

**Circle either TRUE or FALSE for each
of the statements shown.**

[3 marks]

(Turn over)

3. Calculate the answer when,

**‘the largest prime number that is
a factor of 28’**

is multiplied by

**‘the smallest prime number that is
factor of 15’**

[2 marks]

(Turn over)

4. Look at the diagram for Question 4 in the separate Diagram Booklet.

The diagram shows a number machine.

Using the number machine, calculate:

- (a) the INPUT when the OUTPUT is 36

[1 mark]

- (b) the OUTPUT when the INPUT is n .

[2 marks]

(Turn over)

5. Write down three integers, all less than 25, whose

- range is 8, and
- mean is 13

The three integers are _____ ,

_____ and _____

[2 marks]

6. (a) Write down the first three terms of the sequence whose n th term is given by $2n - 5$

The first three terms are _____ ,
_____ and _____

[2 marks]

continued on the next page . . .

(Turn over)

Question 6 continued

6. (b) Write down an expression for the n th term of the following sequence.

7, 11, 15, 19, _____

[2 marks]

(Turn over)

7. Look at the table for Question 7 in the separate Diagram Booklet.

A dice is thrown **50** times.

The number shown on the dice is recorded after each throw.

The table shows the results recorded.

- (a) The relative frequency of throwing a

1 was calculated as $\frac{9}{50} = 0.18$

What was the relative frequency of throwing a 6?

Give your answer as a decimal.

[1 mark]

(Turn over)

Question 7 continued

- 7. (b) The number 4 was thrown 7 times in the first 50 throws. Using THIS FACT, calculate how many times you would expect a 4 to be thrown when this dice is thrown 3000 times.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

**7. (c) How many times would you expect a
4 to be thrown when a FAIR dice is thrown
3000 times?**

[2 marks]

(Turn over)

[4 marks]

(Turn over)

9. Look at the diagram for Question 9 in the separate Diagram Booklet.

The expression in each circle is found by **ADDING** the expressions in the rectangles on either side of the circle.

Complete the diagram by writing expressions in the blank circles and the blank rectangle. You must simplify your expressions.

WORKING SPACE: _____

[3 marks]
(Turn over)

10. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

Look at the diagram for Question 10 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

ABCF is a rectangle.

CDEF is a trapezium.

BD is a straight line.

AB = 7 cm, ***BD*** = 9 cm and ***DE*** = 3 cm.

The perimeter of rectangle ***ABCF*** is 24 cm.

Calculate the AREA of the trapezium ***CDEF***.

You must show all your working.

(Turn over)

11. (a) Calculate $\sqrt{8.5^3 + (4.5 - 0.76)^2}$
correct to 3 significant figures.

[2 marks]

- (b) Calculate the reciprocal of -0.07
correct to 1 decimal place.

[2 marks]

(Turn over)

[5 marks]

(Turn over)

[4 marks]

(Turn over)

[3 marks]

(Turn over)

15. On the sheet provided for Question 15 in the separate Diagram Booklet, construct an accurate drawing of triangle ABC , where $AB = 8 \text{ cm}$, angle $ABC = 90^\circ$ and angle $BAC = 60^\circ$

Use only a ruler and a pair of compasses.

The side AB has been drawn for you.

You must show your construction arcs.

[3 marks]

(Turn over)

[3 marks]

(Turn over)

17. 100 boxes each contain 10 balls.

45 of the boxes are labelled A.

They each contain 7 black balls and 3 white balls.

25 of the boxes are labelled B.

They each contain 4 black balls and 6 white balls.

The rest of the boxes are labelled C.

They each contain 8 black balls and 2 white balls.

**In a game, a player chooses a box at random,
and then chooses a ball at random from
that box.**

**(a) Look at the diagram for Question 17 (a)
in the separate Diagram Booklet.**

The diagram shows a tree diagram.

Complete the tree diagram shown.

[1 mark]

continued on the next page . . .

(Turn over)

Question 17 continued

17. (b) What is the probability that a player will select a black ball?

[3 marks]

continued on the next page . . .

(Turn over)

Question 17 continued

17. (c) If a large number of people played the game, approximately what fraction of them would you expect to choose a white ball?
Circle your answer.

$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$
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[1 mark]

(Turn over)

18. (a) Factorise $x^3 - 5x$

[1 mark]

(b) Expand and simplify $(2x - 3)(x + 4)$

[2 marks]

continued on the next page . . .

(Turn over)

Question 18 continued**18. (c) Factorise $x^2 - 3x - 28$**

[2 marks]**(Turn over)**

19. (a) Circle the equation of a straight line that is parallel to the line $3y = 2x + 6$

$$3y = 2x + 7$$

$$2y = 3x + 6$$

$$3y = -2x + 6$$

$$-3y = 2x + 6$$

$$2y = -3x + 6$$

[1 mark]

continued on the next page . . .

(Turn over)

Question 19 continued

19. (b) Circle the equation of a straight line that is perpendicular to the line $y = 5x - 3$

$$y = \frac{x}{5} + 3$$

$$y = 5x + 3$$

$$y = 5x + \frac{1}{3}$$

$$y = -5x + 3$$

$$y = \frac{-x}{5} + 3$$

[1 mark]

(Turn over)

20. Look at the diagram for Question 20 in the separate Diagram Booklet. The diagram is NOT drawn to scale.

Points A , B and C lie on the circumference of a circle, centre O .

Angle $ACB = 37^\circ$

Calculate the size of the REFLEX angle AOB .

[2 marks]

(Turn over)

21. Look at the diagram for Question 21 in the separate Diagram Booklet. The diagram is NOT drawn to scale.

The area of triangle ABD , shown in the diagram, is 35 cm^2

$AD = 5 \text{ cm}$ and $BC = 32 \text{ cm}$.

D is on the line AC , and

BD is perpendicular to AC .

Calculate the size of angle X .

You must show all your working.

(Turn over)

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Diagram Booklet

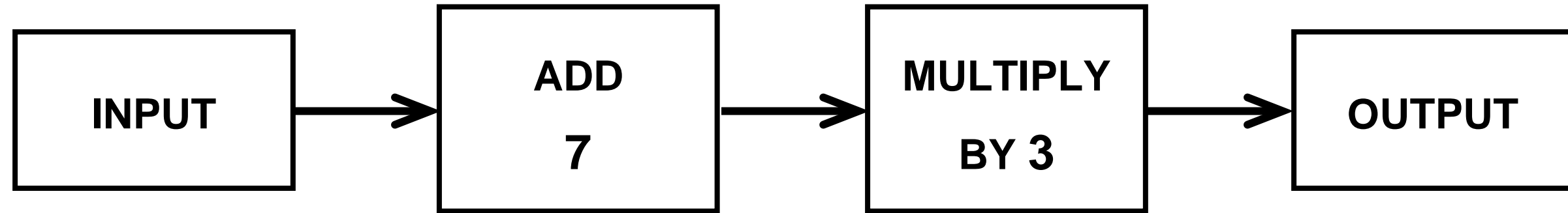
Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

Question 2

Table

A triangle with one angle equal to 70° could be an equilateral triangle.	TRUE	FALSE
A triangle with one angle equal to 70° could be an isosceles triangle.	TRUE	FALSE
A triangle with one angle equal to 70° could be a right – angled triangle.	TRUE	FALSE
An isosceles triangle could have one of its angles equal to 105°	TRUE	FALSE
A right – angled triangle could have one of its angles equal to 105°	TRUE	FALSE

Question 4

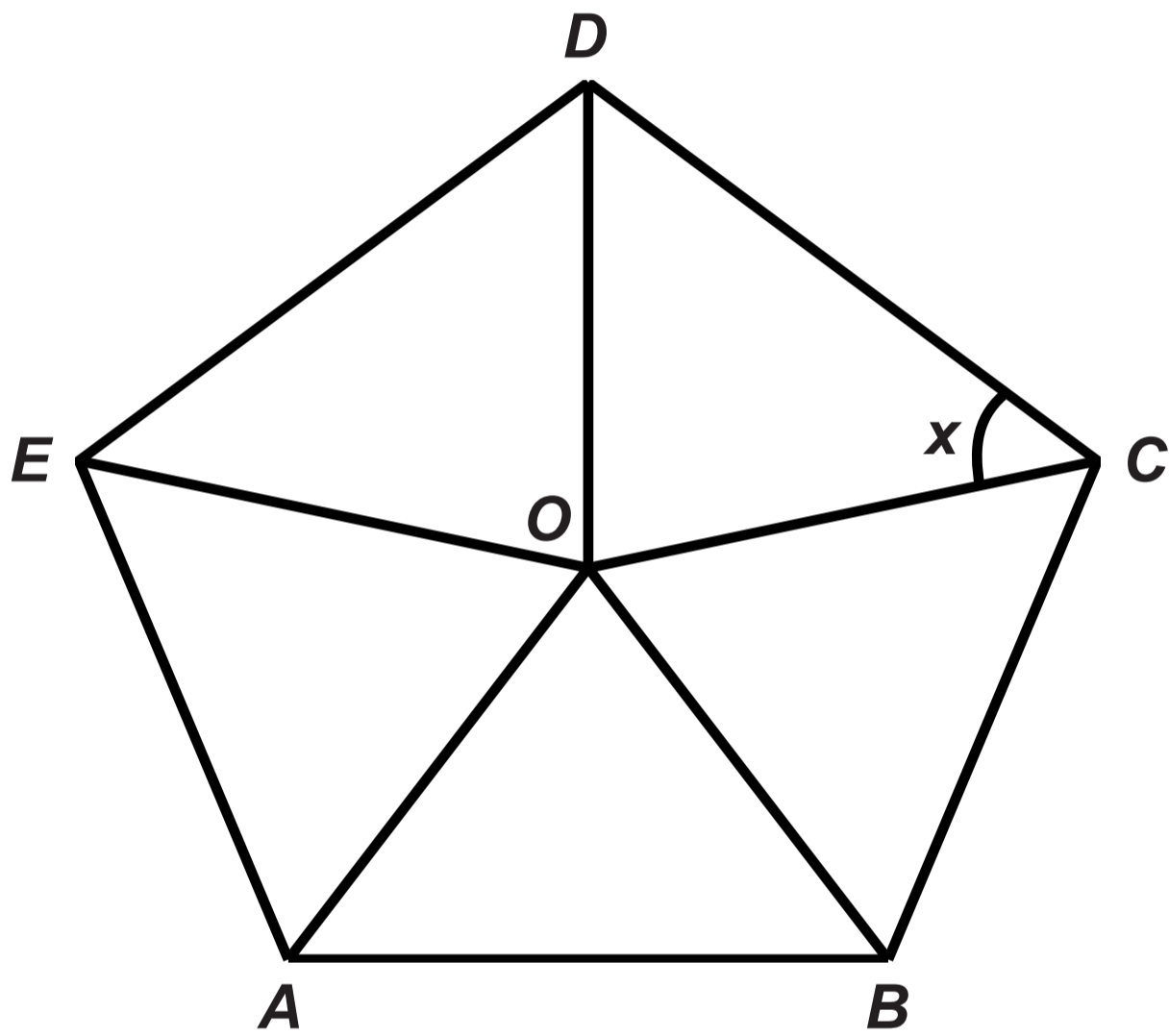


Question 7
Table

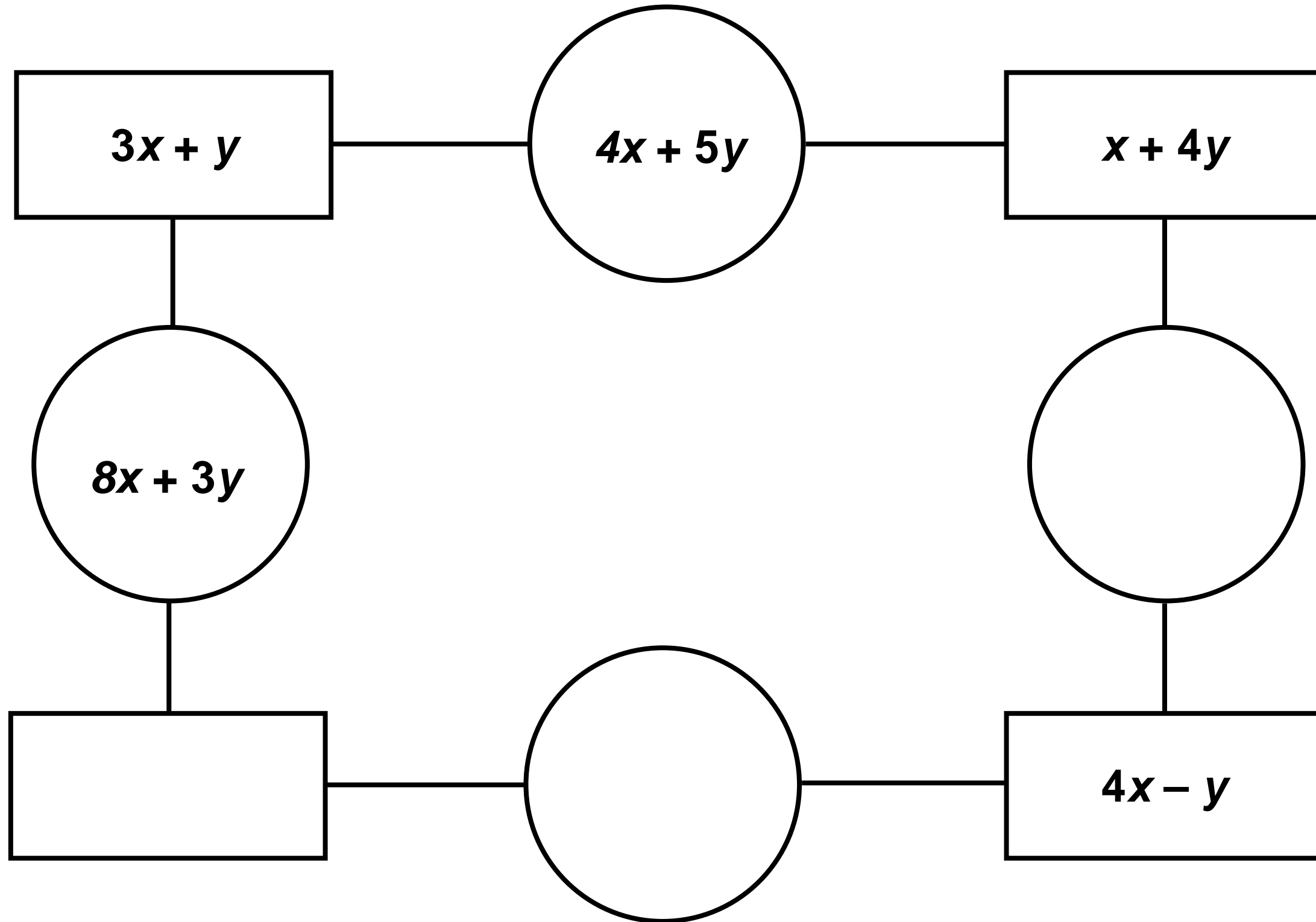
Number shown on dice	1	2	3	4	5	6
Frequency	9	7	8	7	6	13

Question 8

Diagram NOT drawn to scale

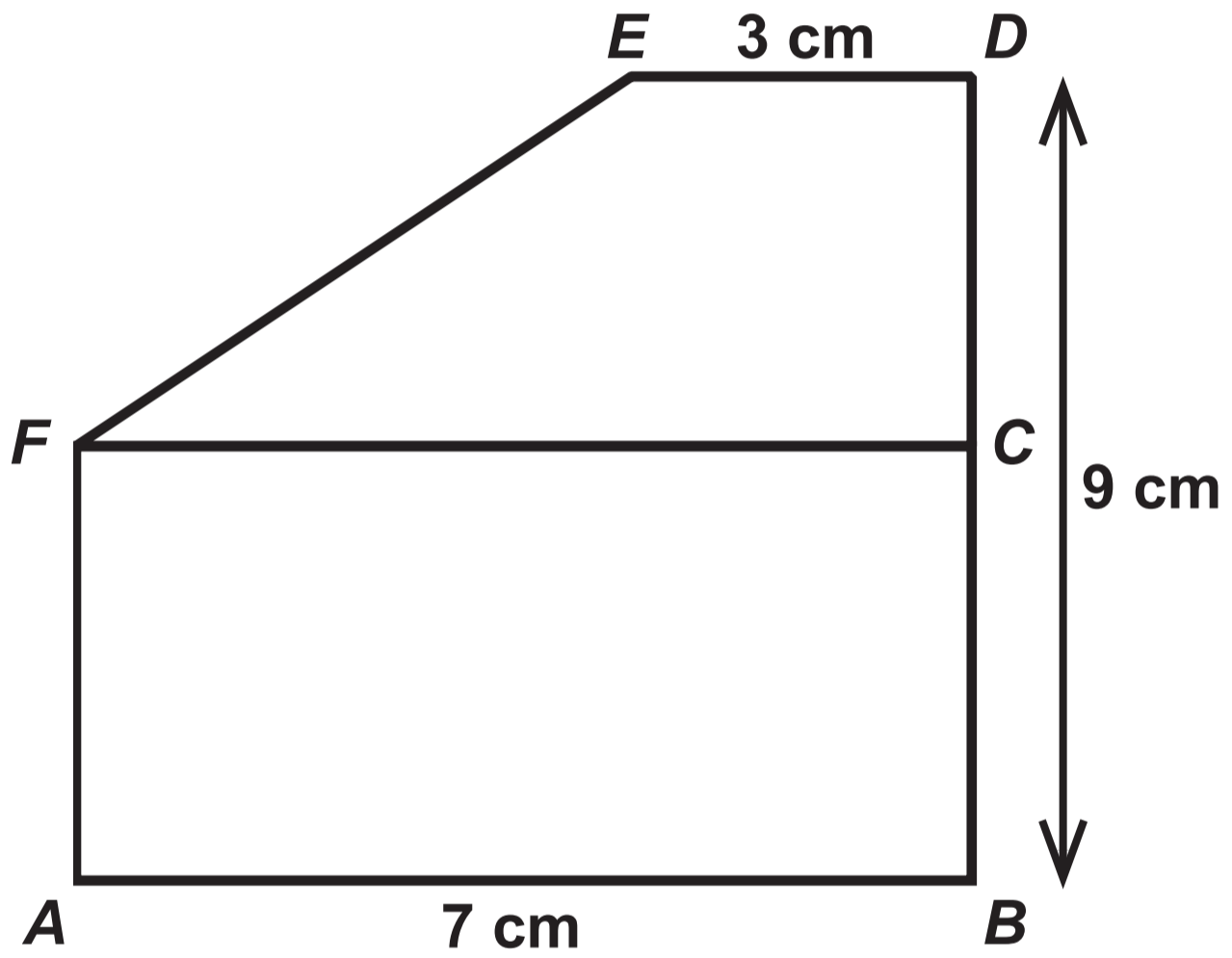


Question 9



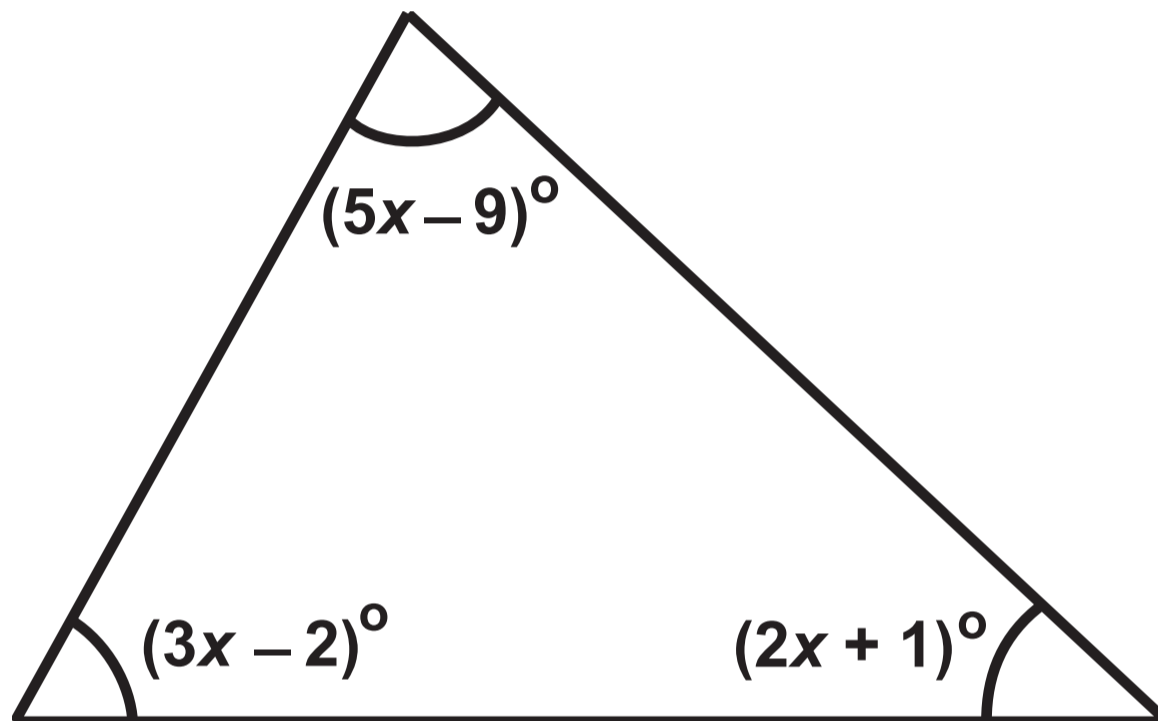
Question 10

Diagram NOT drawn to scale



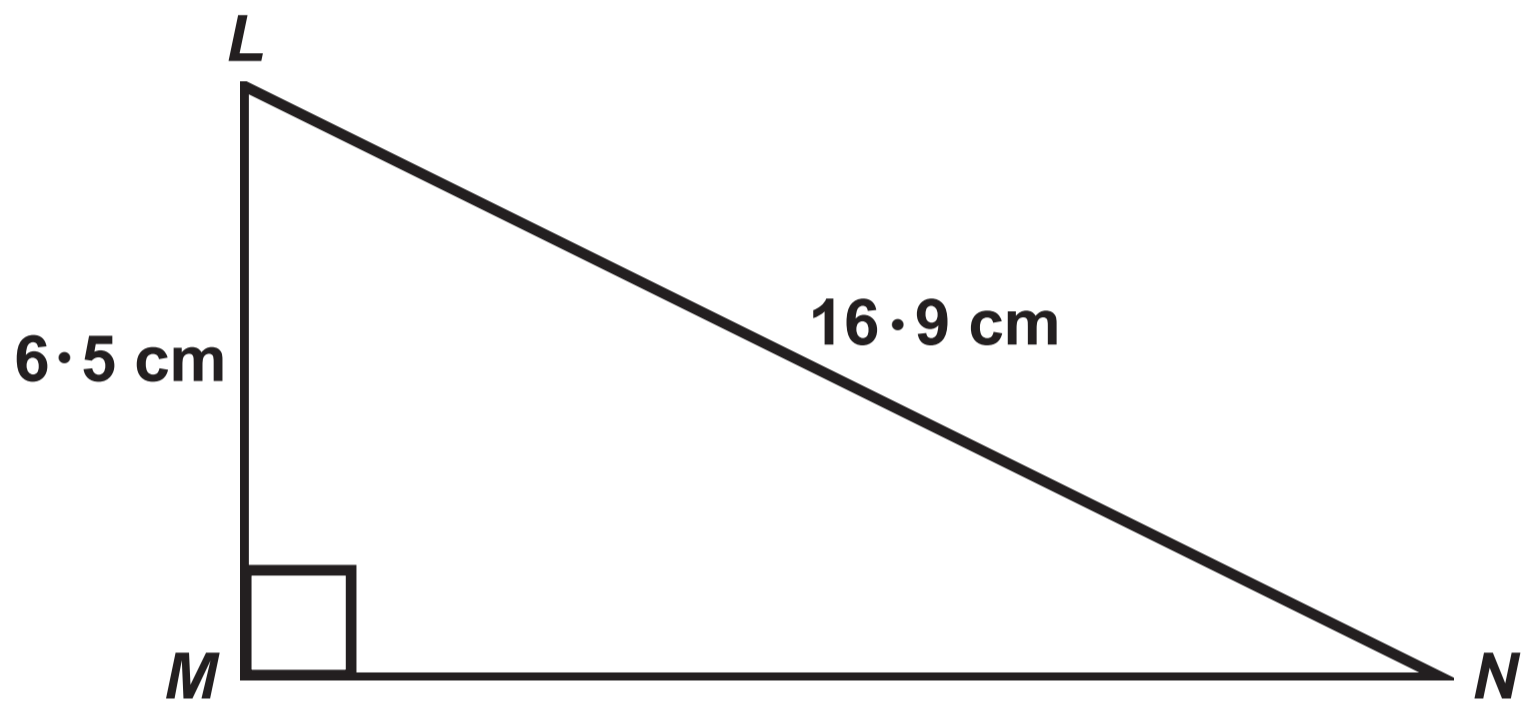
Question 12

Diagram NOT drawn to scale



Question 14

Diagram NOT drawn to scale

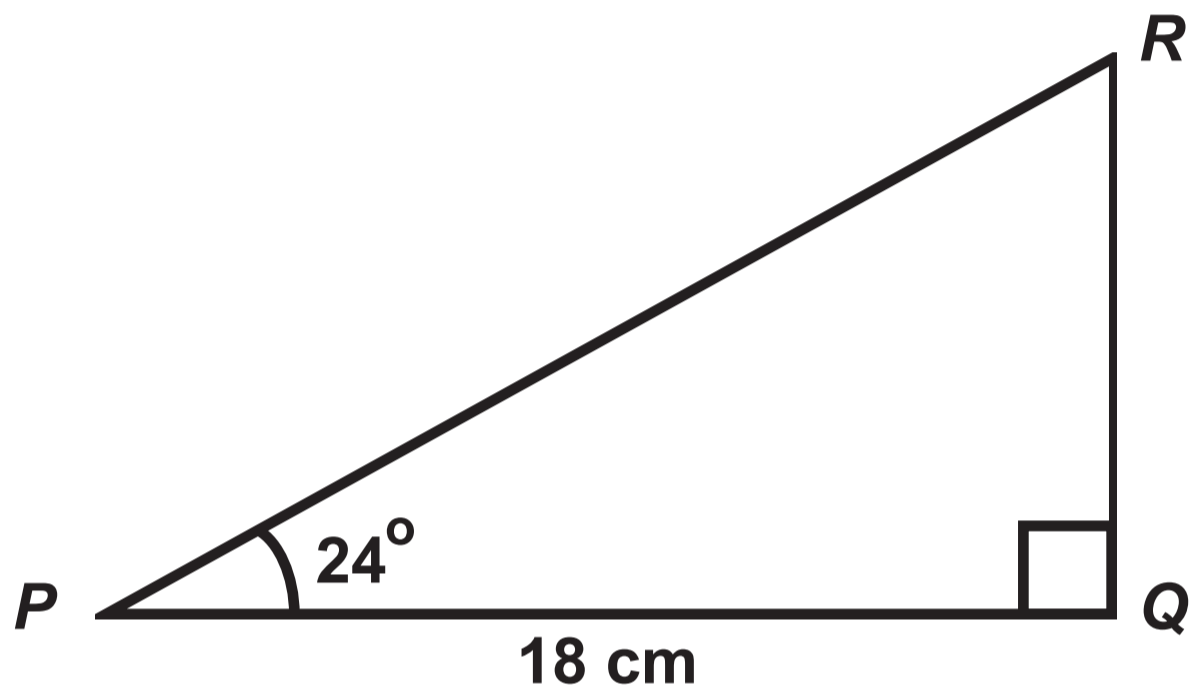


Question 15



Question 16

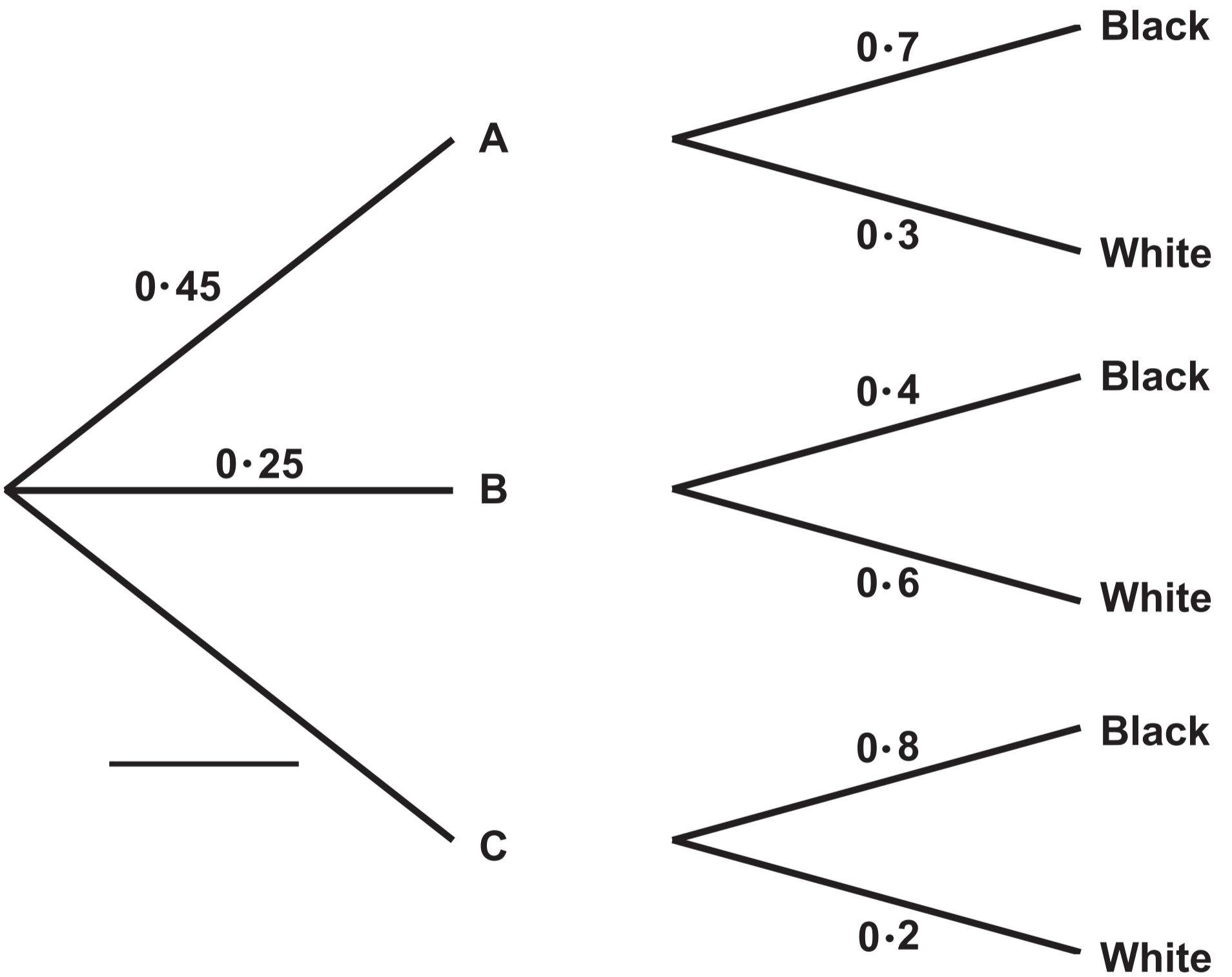
Diagram NOT drawn to scale



Question 17 (a)

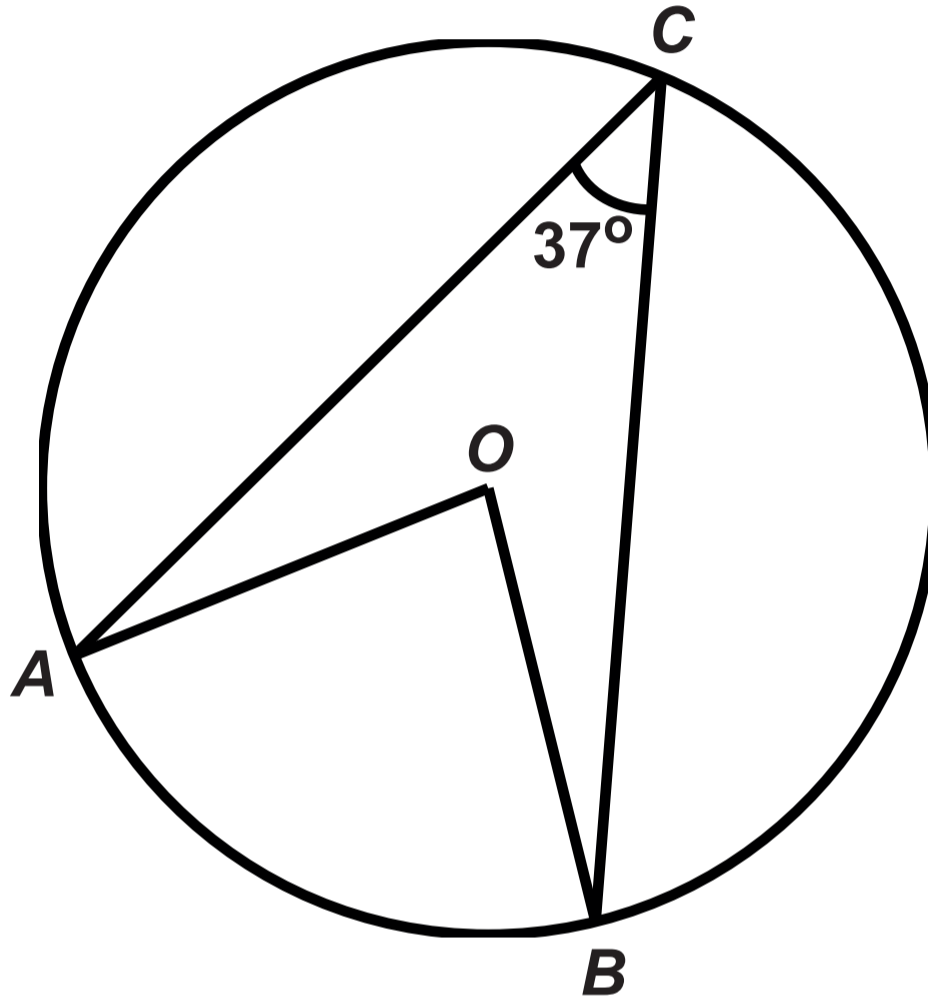
Choice of box

Choice of balls



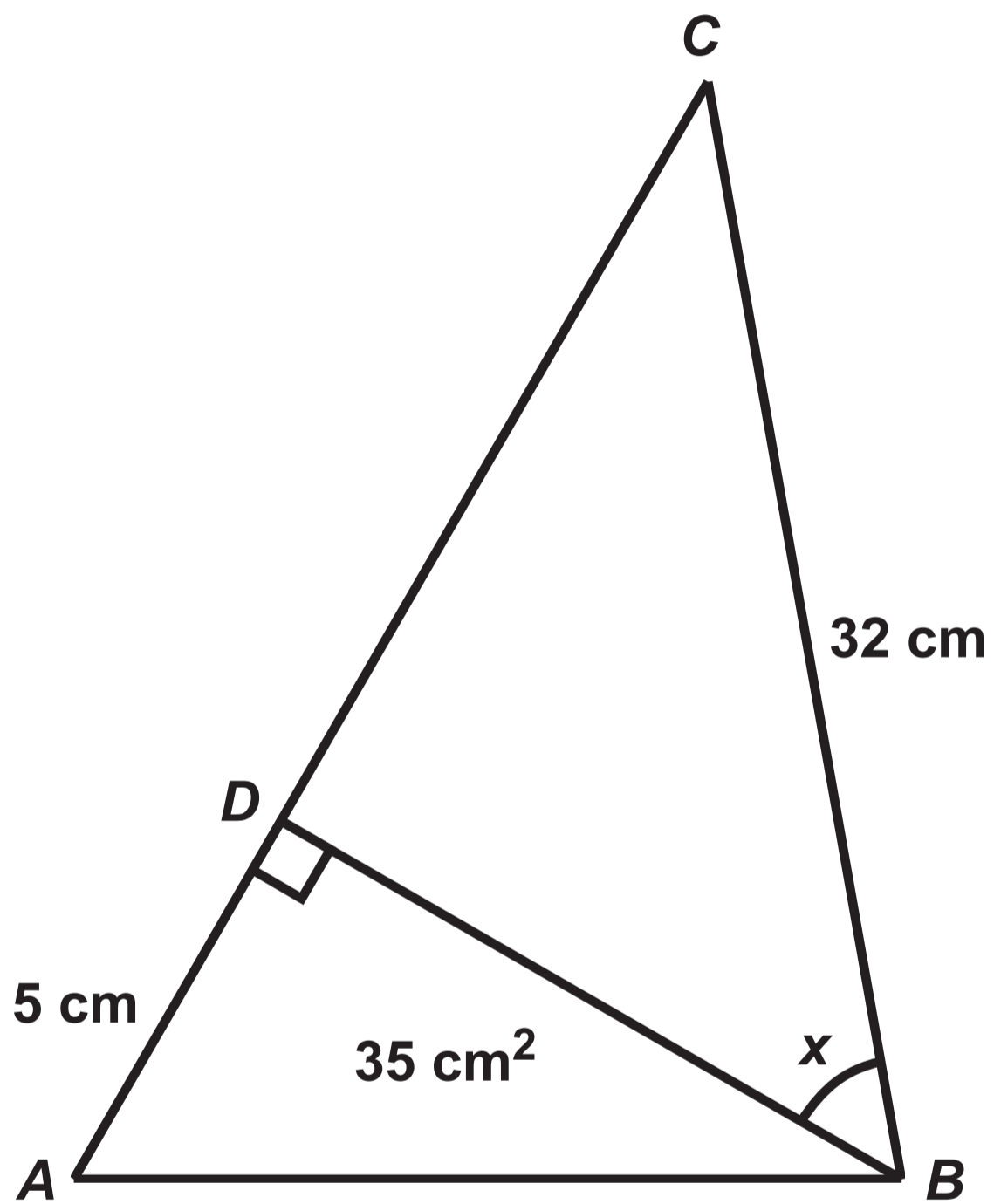
Question 20

Diagram NOT drawn to scale



Question 21

Diagram NOT drawn to scale



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Spare Diagram Booklet

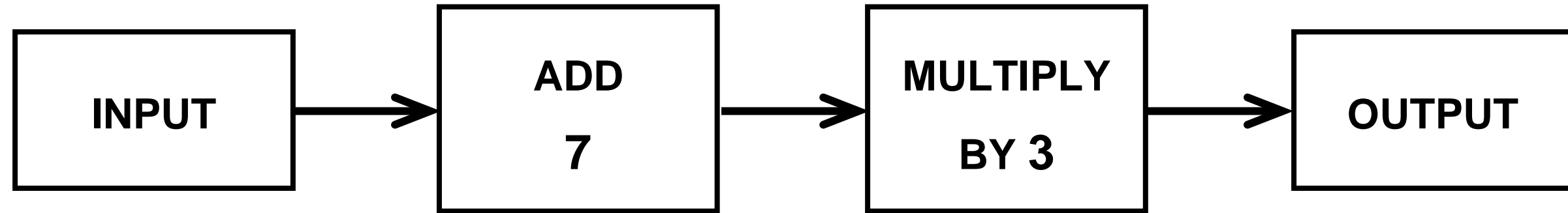
Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

Question 2

Table

A triangle with one angle equal to 70° could be an equilateral triangle.	TRUE	FALSE
A triangle with one angle equal to 70° could be an isosceles triangle.	TRUE	FALSE
A triangle with one angle equal to 70° could be a right – angled triangle.	TRUE	FALSE
An isosceles triangle could have one of its angles equal to 105°	TRUE	FALSE
A right – angled triangle could have one of its angles equal to 105°	TRUE	FALSE

Question 4

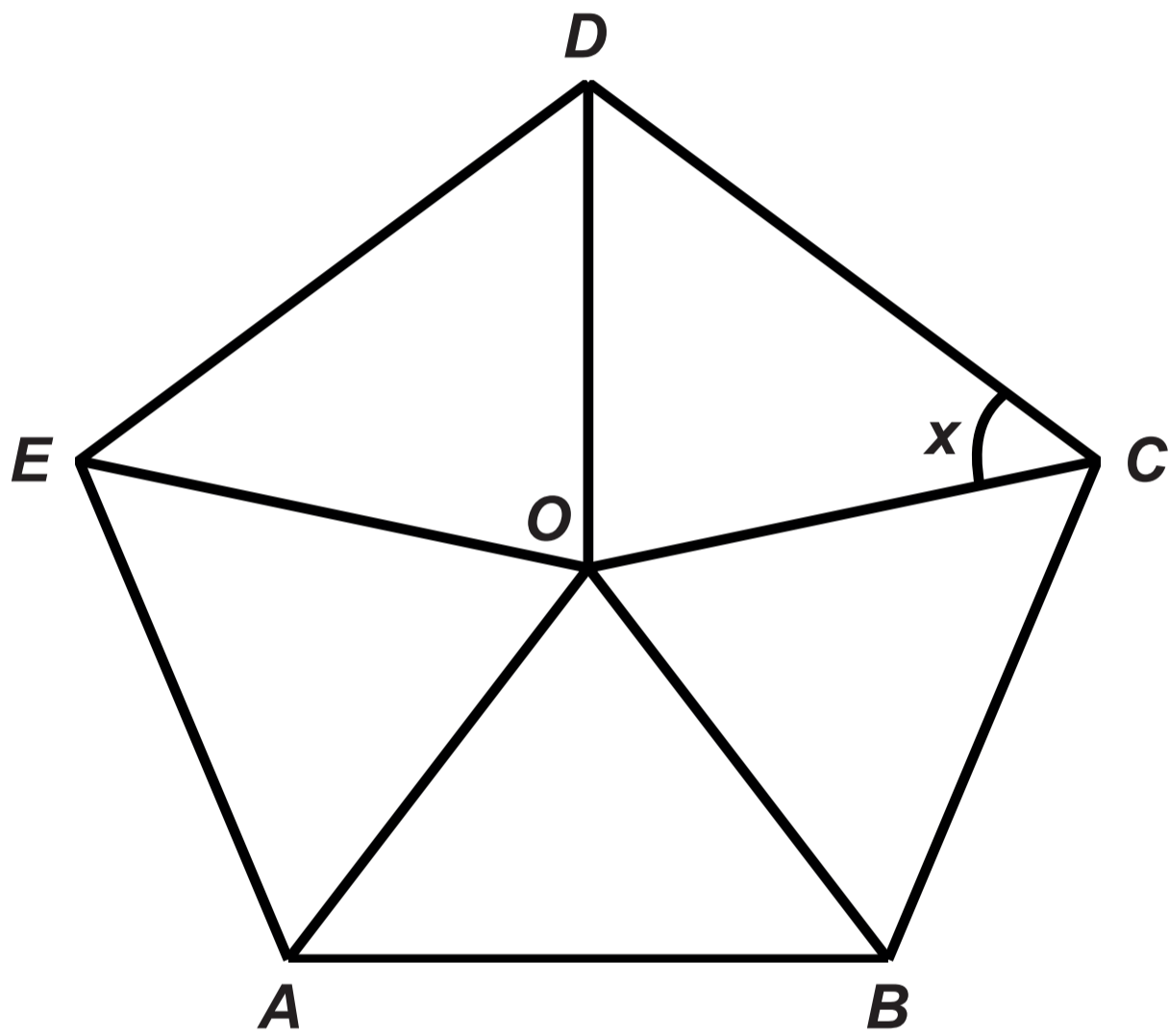


Question 7
Table

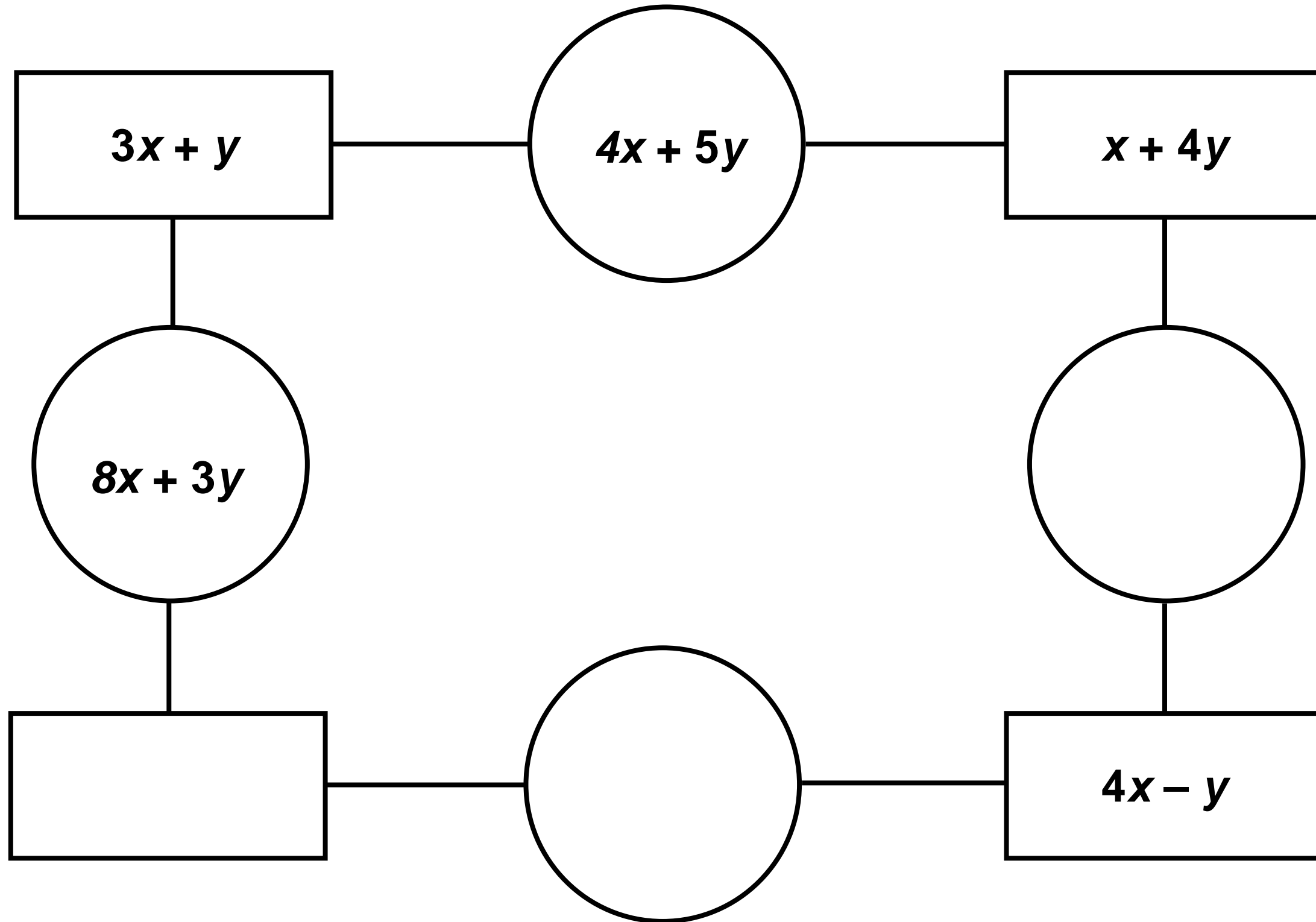
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Frequency	9	7	8	7	6	13

Question 8

Diagram NOT drawn to scale

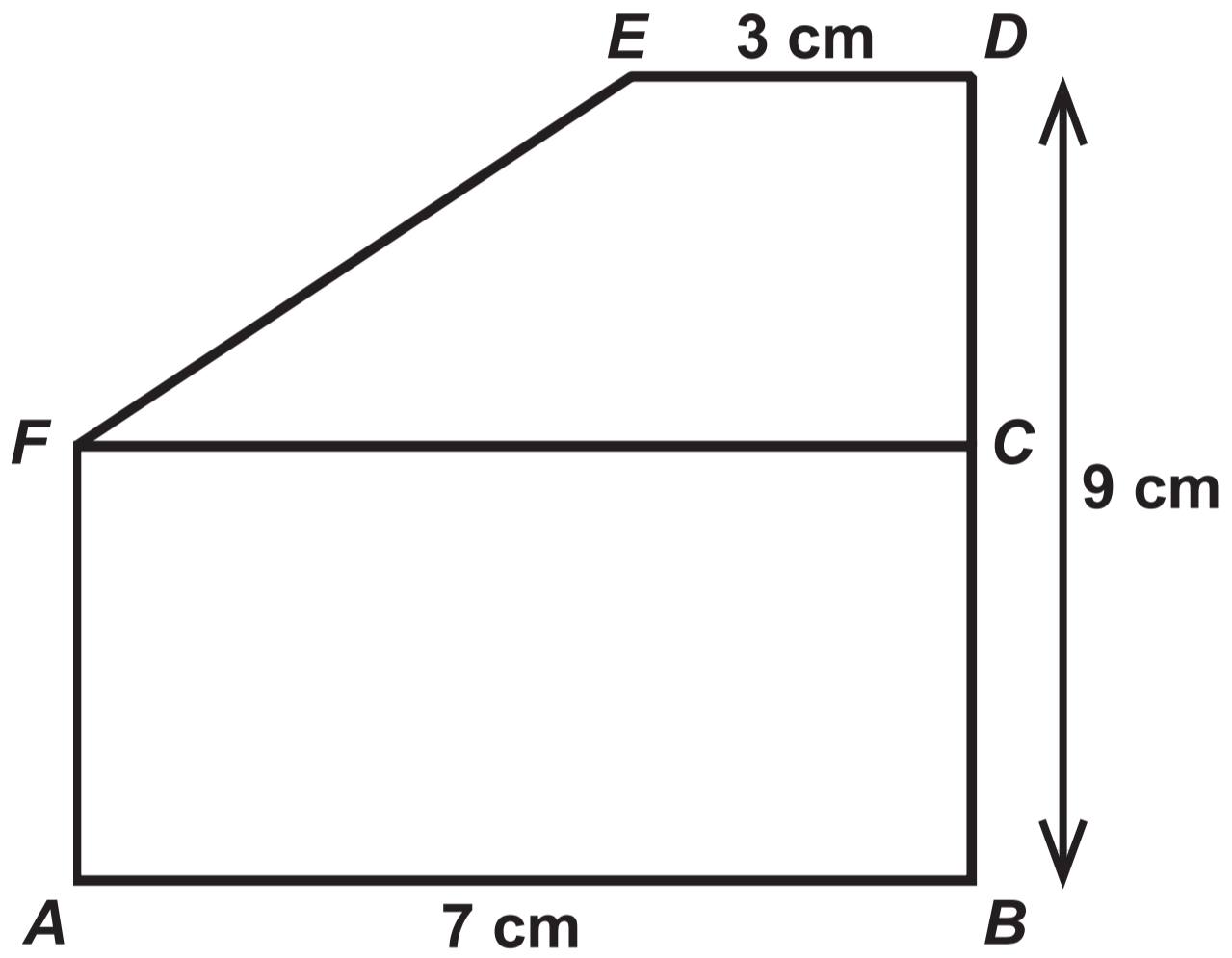


Question 9



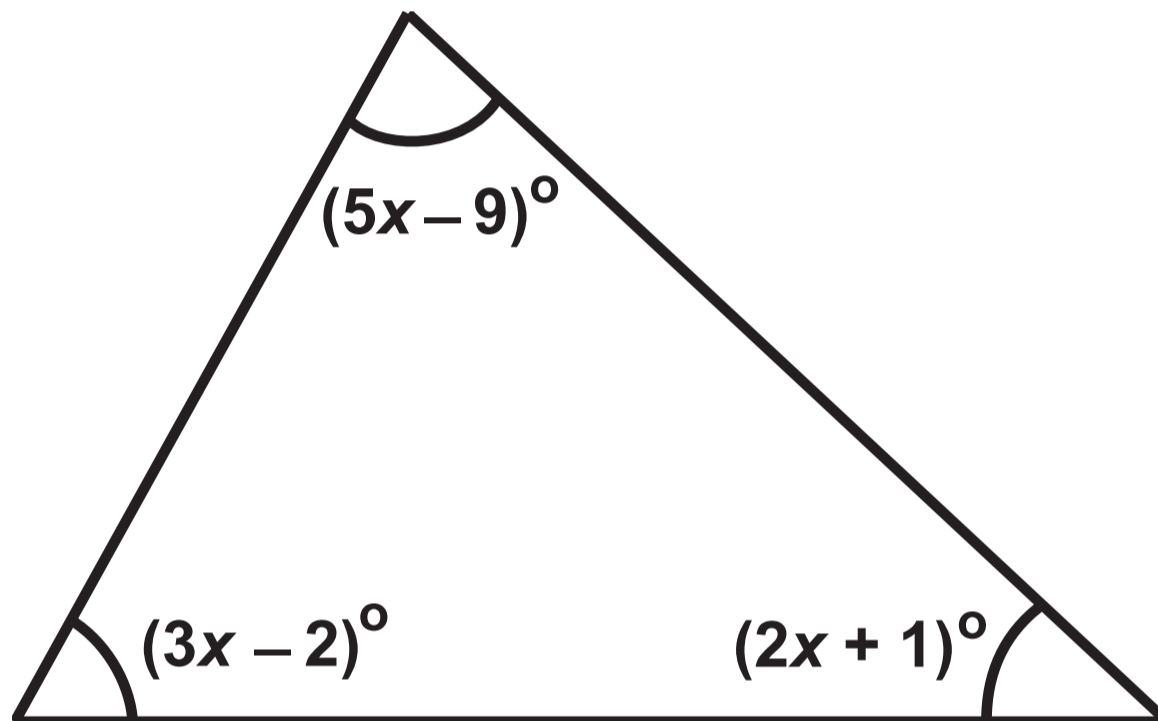
Question 10

Diagram NOT drawn to scale



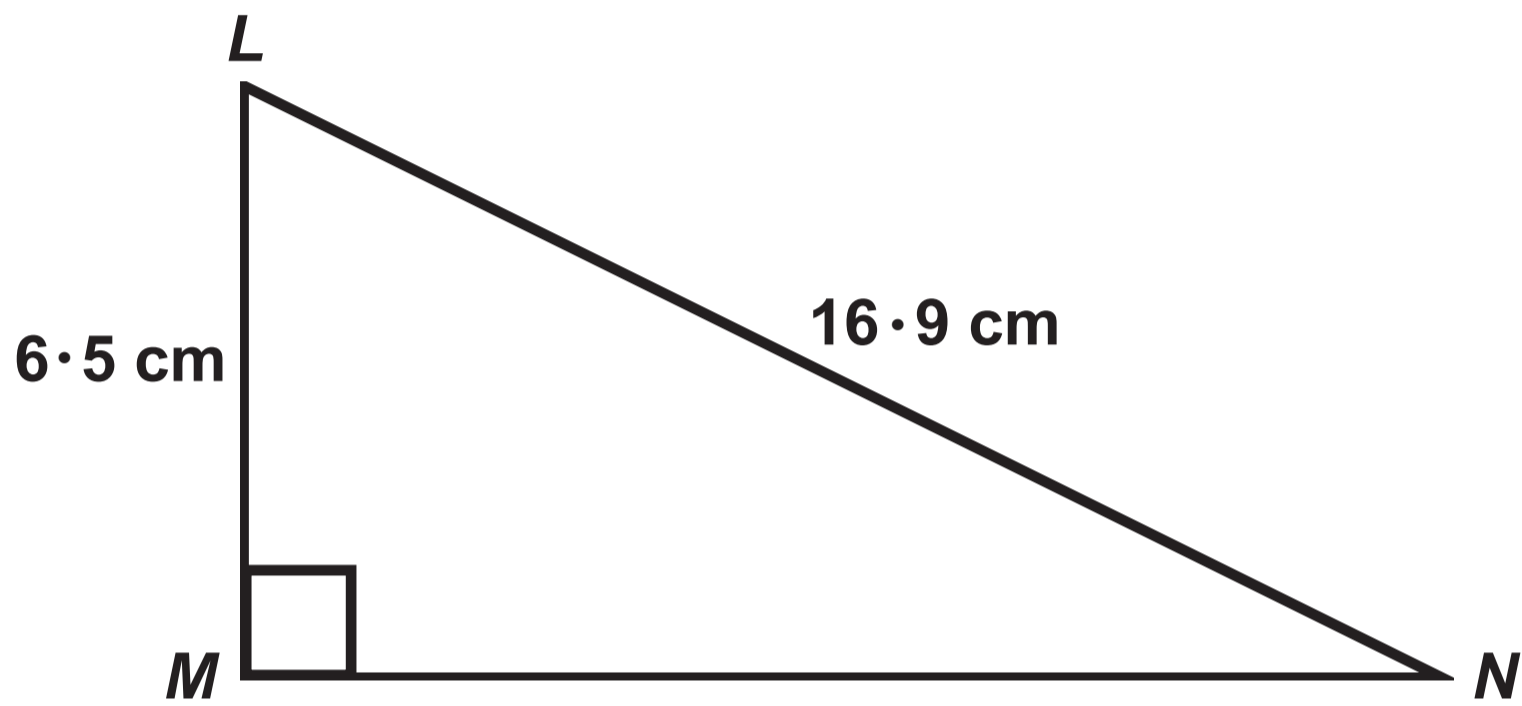
Question 12

Diagram NOT drawn to scale



Question 14

Diagram NOT drawn to scale

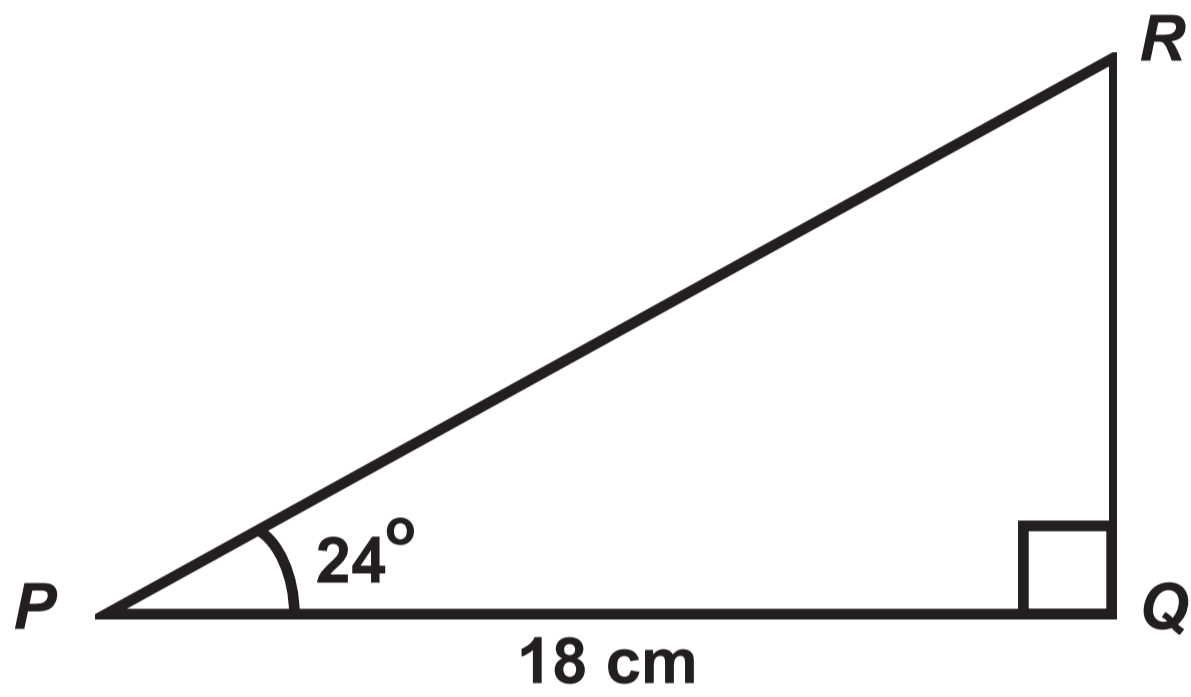


Question 15



Question 16

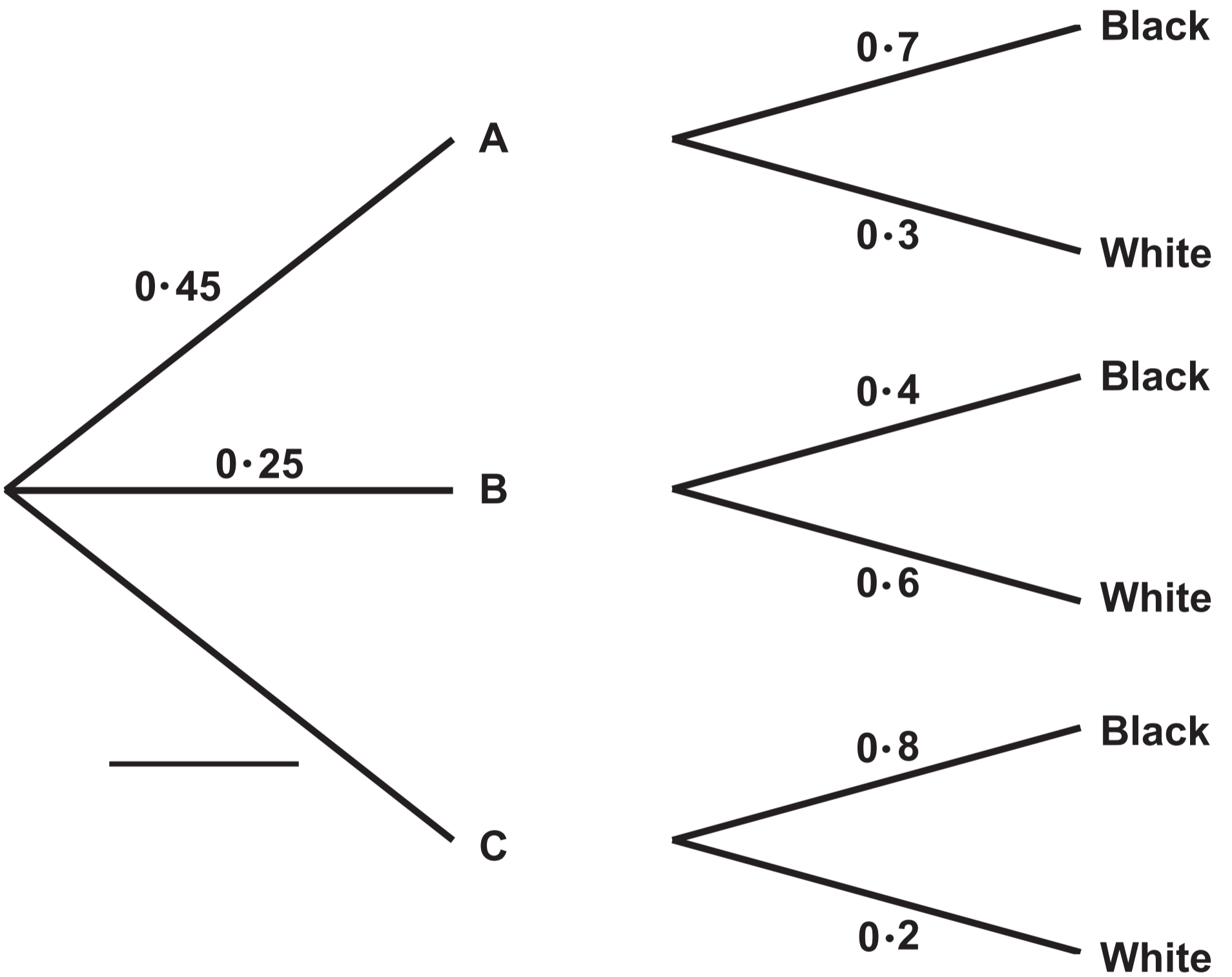
Diagram NOT drawn to scale



Question 17 (a)

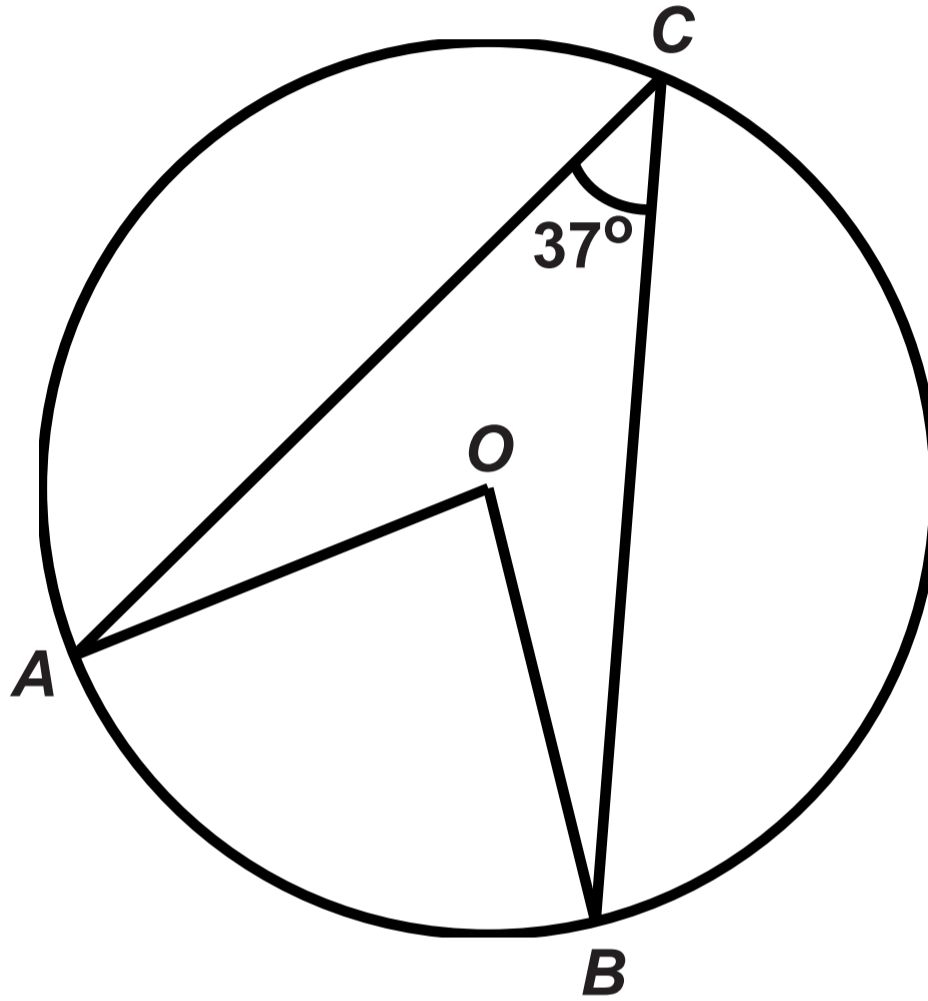
Choice of box

Choice of balls



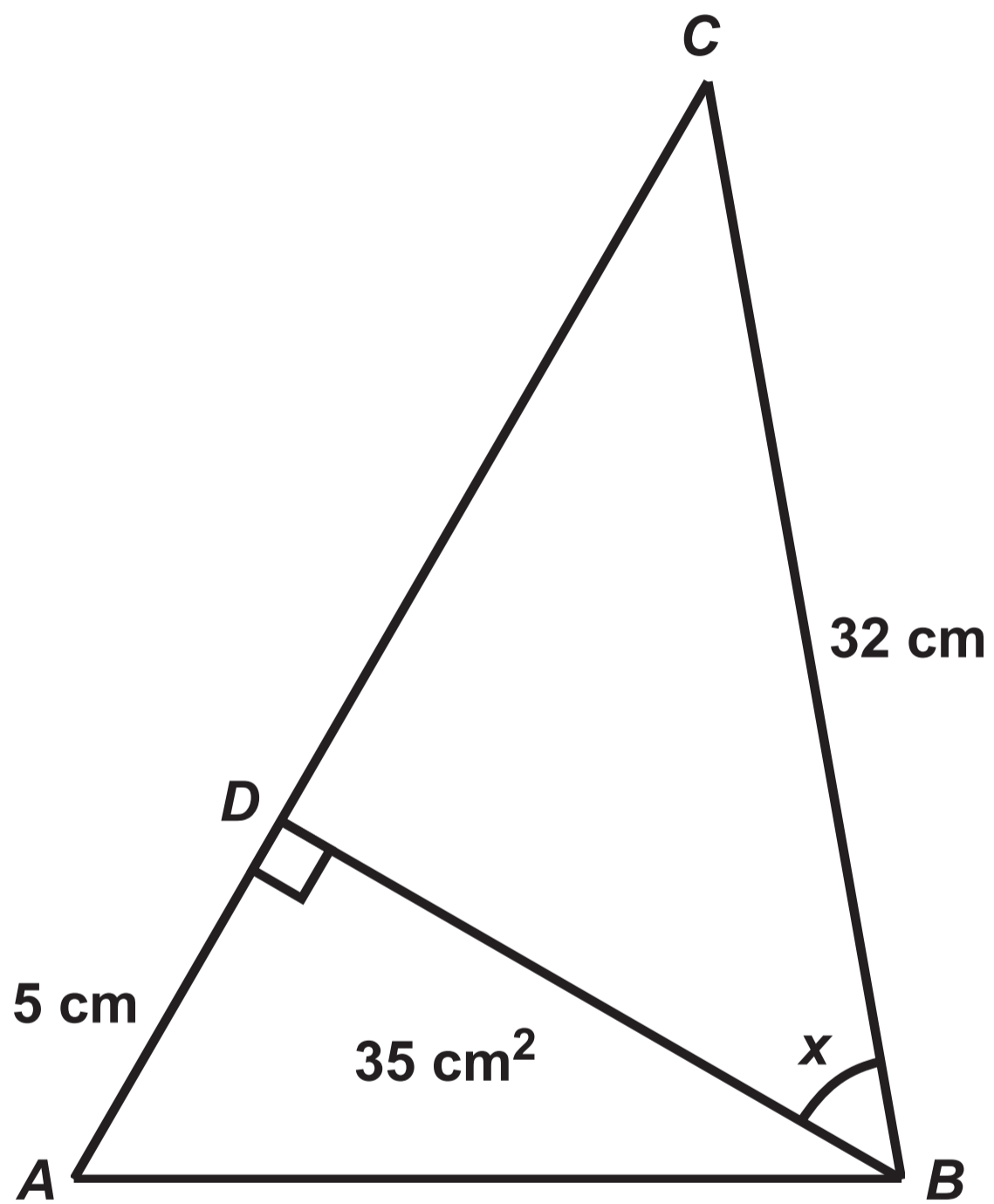
Question 20

Diagram NOT drawn to scale



Question 21

Diagram NOT drawn to scale



**GCSE – NEW
MATHEMATICS**



and

NUMERACY

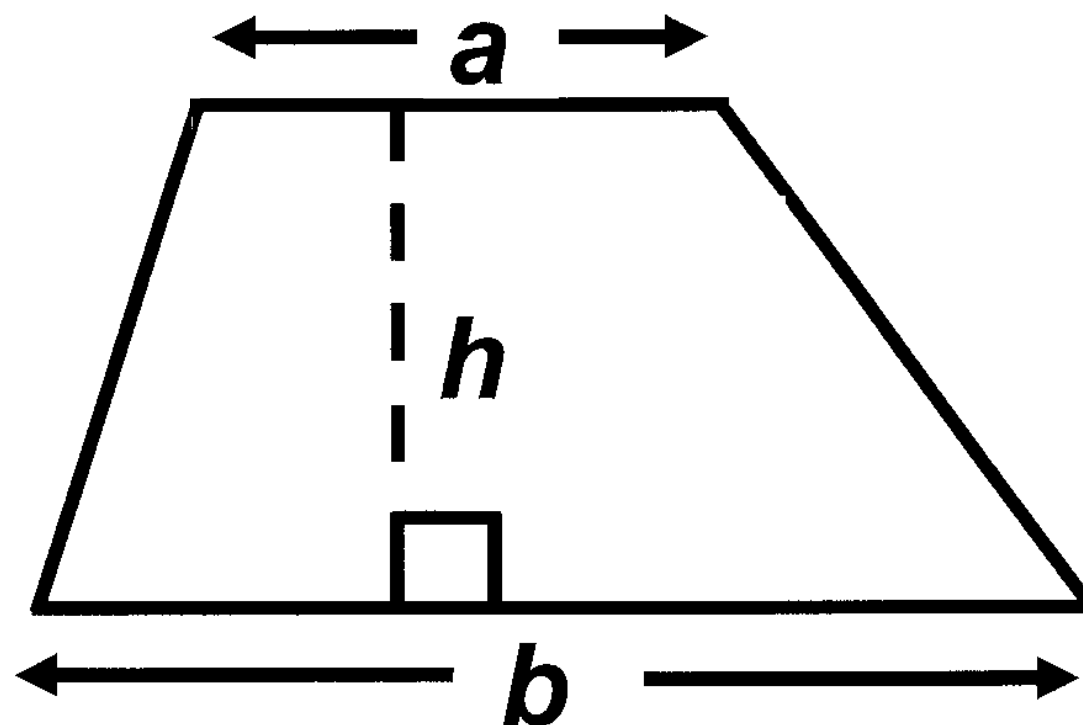
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

You must not write on these formula pages.

Anything you write on these formula pages will gain NO credit.

Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2} (a + b) h$



Volume of prism =
area of cross – section \times length

