

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

For this paper you must have:

- a calculator
- mathematical instruments.



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

[Turn over]



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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

- 3 What is 625 as a power of 5 ?
Circle your answer. [1 mark]

5^3

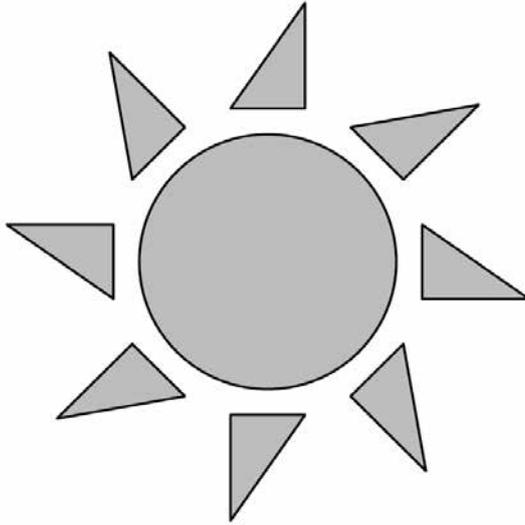
5^4

5^5

5^{125}



- 4 Circle the order of rotational symmetry of this drawing. [1 mark]



0 2 4 8

- 5 Work out the value of $3^6 - \sqrt{841}$
[2 marks]

Answer _____

[Turn over]

| |
|---|
| |
| 6 |



6 Gemma has four groups of friends on a social media site.

The table shows the number of friends in each group.

| Group | Number of friends |
|----------------|--------------------------|
| Family | 8 |
| Netball | 8 |
| School | 26 |
| Guides | 11 |

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

| | |
|---------|-----|
| Family | ○ ○ |
| Netball | ○ ○ |
| School | |
| Guides | |

[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]

Answer _____

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- 8 The numbers 1 to 12 are put in a grid.
2, 4, 5, 7, 10 and 12 are shown.

| | | | |
|----|--|---|----|
| | | 5 | 10 |
| 12 | | | |
| 4 | | | |
| 7 | | 2 | |

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

[Turn over]

| |
|---|
| |
| 7 |



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]

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]

Answer

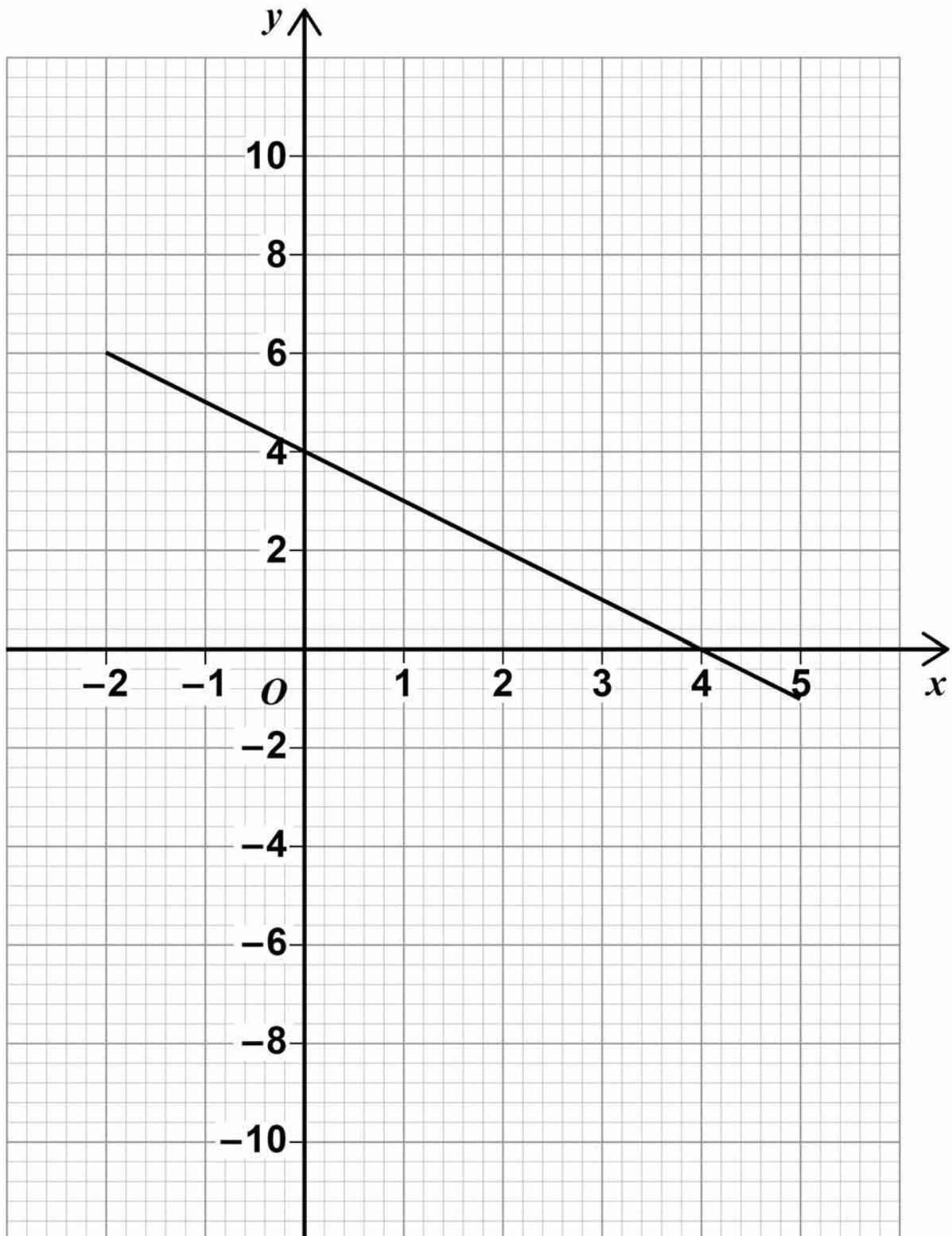
15 The graph of $y = 4 - x$ for values of x from -2 to 5 is shown on the grid opposite.

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]

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| 8 |

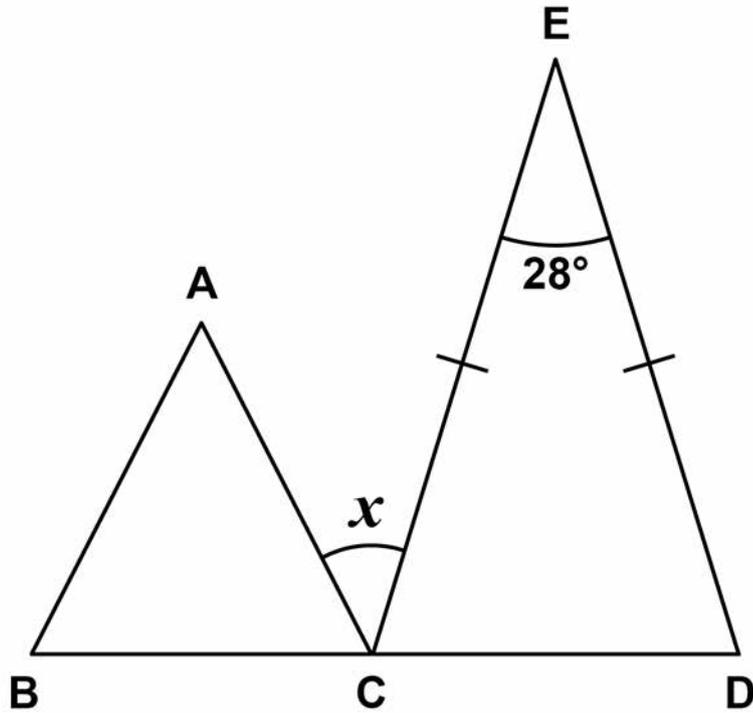


16 (a) BCD is a straight line.

Triangle ABC is equilateral.

$$CE = DE$$

The diagram is not drawn accurately.



Work out the size of angle x . [4 marks]



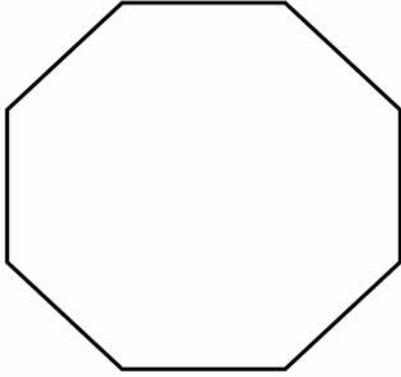
Answer _____ **degrees**

[Turn over]



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

Give a reason for your answer. [1 mark]

| |
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| 5 |



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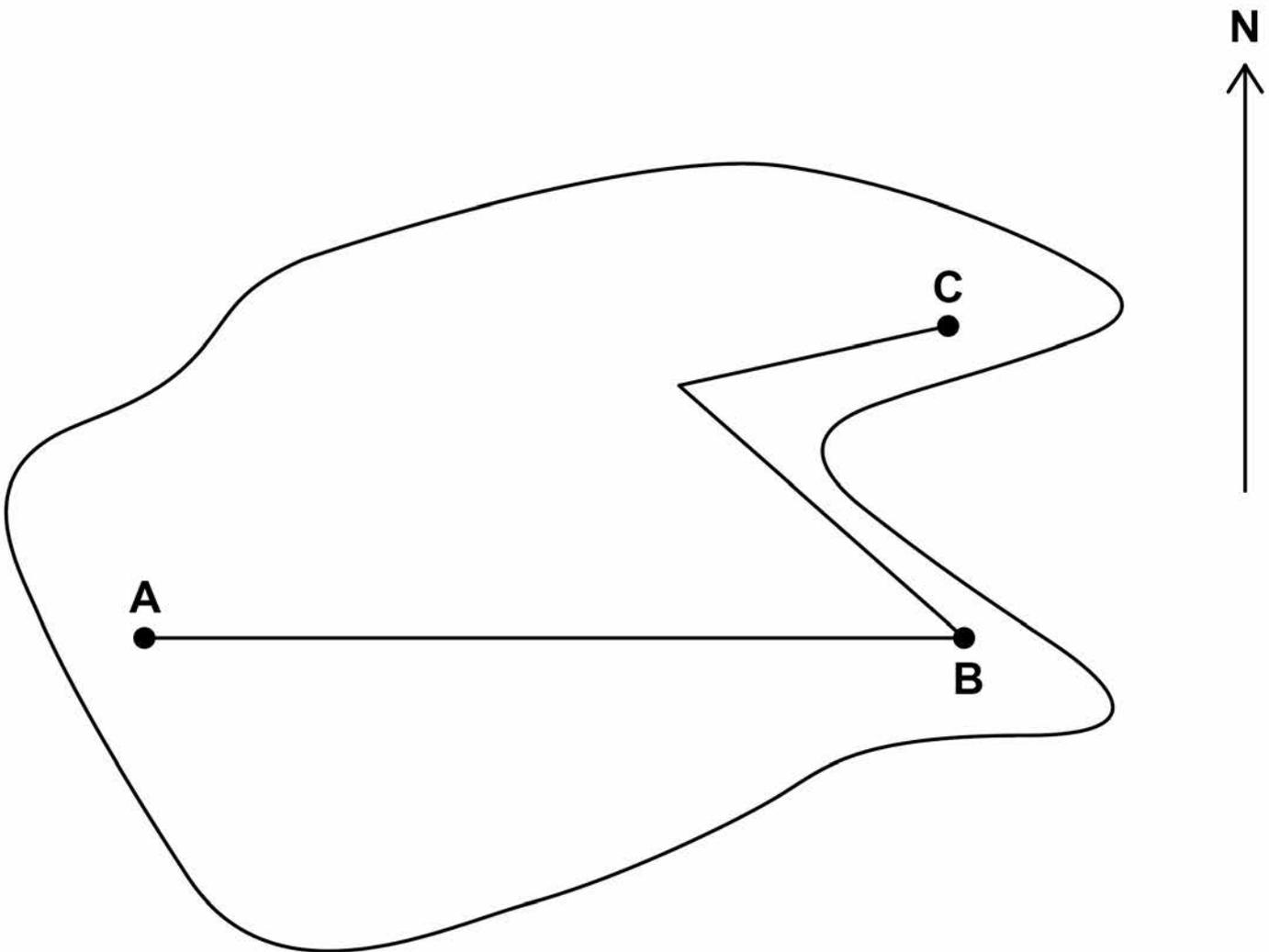
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- 17 Here is a map of an island with cities A, B and C. The straight lines represent roads.

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]

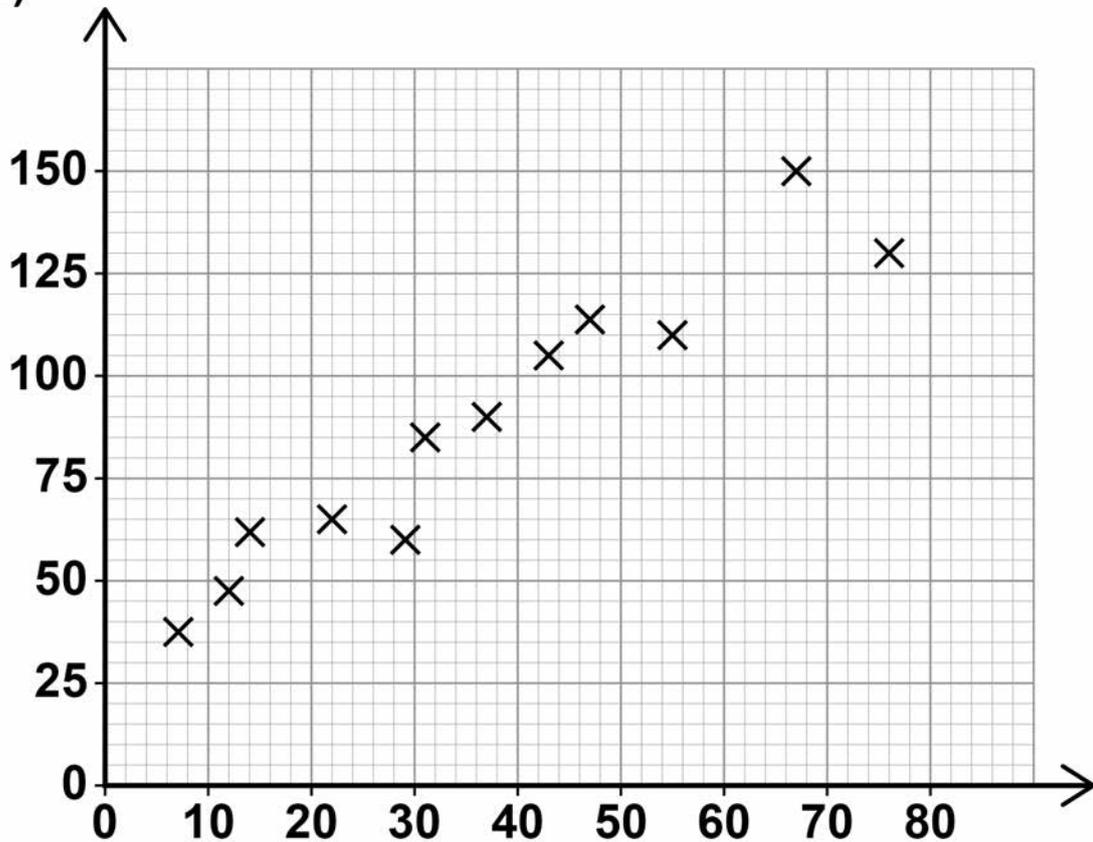
Answer _____ °



- 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
(£)



Sales of umbrellas (£)

- 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 £ _____

- 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

[Turn over]

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21 (a) A circle has radius 4.2 cm

Work out the length of the circumference.

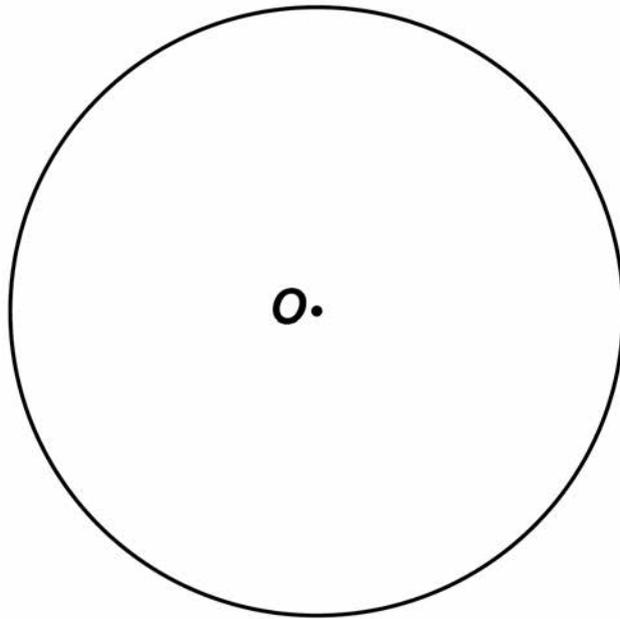
Give your answer to 1 decimal place. [3 marks]

Answer _____ cm



21 (b) The circle below has centre O .

Draw a sector on the circle. [1 mark]

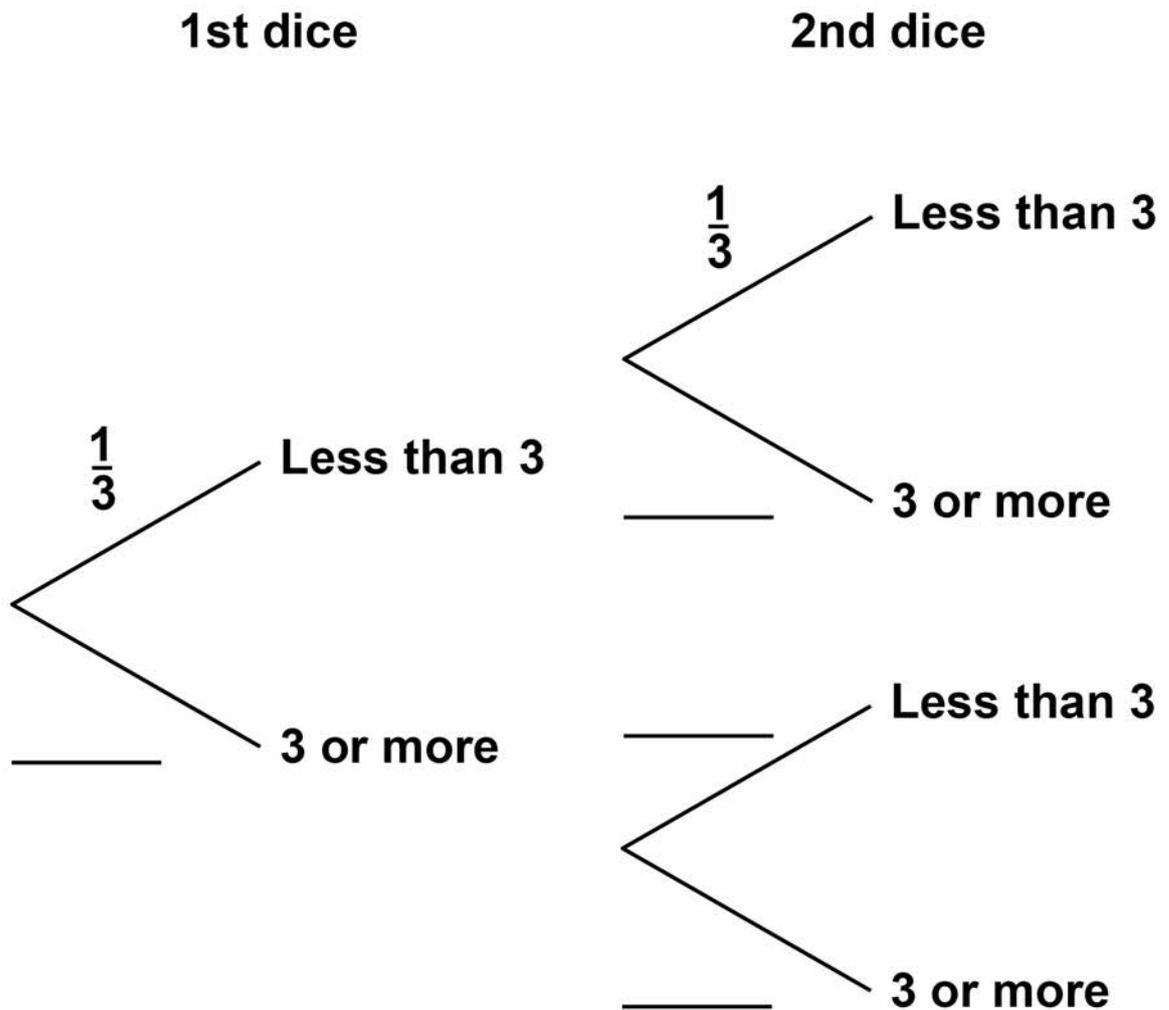


[Turn over]



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]

Answer _____

[Turn over]

| |
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| 6 |



- 23 Match each sequence to its description.
One has been done for you. [4 marks]

1 1 2 3 5 8

1 2 4 8 16 32

1 2 3 4 5 6

1 3 6 10 15 21

1 4 9 16 25 36

1 8 27 64 125 216

Arithmetic
progression

Geometric
progression

Fibonacci
sequence

Triangular
numbers

Cube numbers

Square numbers



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[Turn over]



- 24 The table shows information about the population of a city.

| Population in 2001 | Population in 2011 |
|--------------------|--------------------|
| 420 000 | 480 000 |

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,

$$\begin{aligned} &\text{population increase from 2001 to 2011} \\ &= 480\,000 - 420\,000 \\ &= 60\,000 \end{aligned}$$

$$\begin{aligned} &\text{population in 2021} \\ &= 480\,000 + 60\,000 \\ &= 540\,000 \end{aligned}$$

Does the population of 540 000 match his claim?

You MUST show your working. [3 marks]

Answer _____

[Turn over]

| |
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| |
| 7 |



- 25 On three days, Ali throws darts at a target. Here are his results.

| | Number of throws | Number of hits | Number of misses |
|-----------|------------------|----------------|------------------|
| Monday | 20 | 15 | 5 |
| Tuesday | 30 | 22 | 8 |
| Wednesday | 40 | 17 | 23 |
| Total | 90 | 54 | 36 |

- 25 (a) Work out TWO different estimates for the probability of Ali hitting the target. [2 marks]

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 _____

[Turn over]



Answer _____

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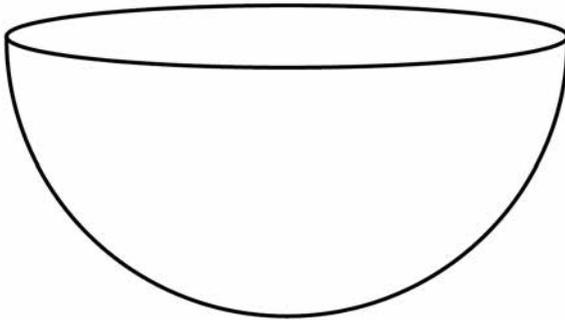
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27

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 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]



Answer _____

[Turn over]



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]

_____ cm \leq length $<$ _____ cm

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

_____ cm \leq perimeter $<$ _____ cm

| |
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END OF QUESTIONS



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| For Examiner's Use | |
|--------------------|------|
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