Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3300U20-1

S23-3300U20-1

WEDNESDAY, 14 JUNE 2023 – MORNING

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
FOUNDATION TIER

1 hour 30 minutes

ADDITIONAL MATERIALS

A calculator will be required for this examination.

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

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take π as 3·14 or use the π button on your calculator.

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 of writing.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**3**	
2.	**3**	
3.	**3**	
4.	**3**	
5.	**2**	
6.	**4**	
7.	**2**	
8.	**4**	
9.	**3**	
10.	**5**	
11.	**4**	
12.	**3**	
13.	**3**	
14.	**4**	
15.	**3**	
16.	**3**	
17.	**5**	
18.	**3**	
19.	**5**	
Total	**65**	

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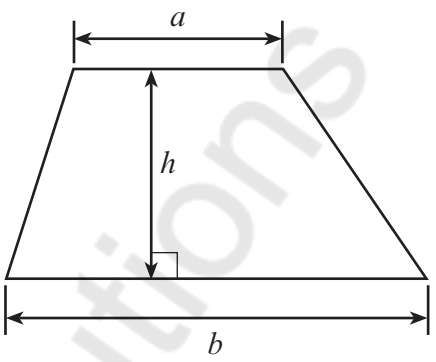
Formula List – Foundation Tier

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



Examiner only

1. (a) Calculate the sum of 8732 and 6482. [1]

$$8732 + 6482 = 15214$$

$$= 15214$$

(b) What number, when multiplied by 69, gives the answer 345? [1]

$$x \times 69 = 345$$

$$x = \frac{345}{69} = 5$$

(c) Calculate the difference between 9756 and 8932. [1]

$$9756 - 8932 = 824$$

$$= 824$$

2. Choose the best expression from those given below to complete the following sentences.

impossible **unlikely** **an even chance** **likely** **certain**

(a) It is Certain that I will eat or drink something this week. [1]

(b) It is Impossible that I will roll a 7 when a fair six-sided dice is thrown. [1]

(c) It is Unlikely that I will win a raffle if I buy one ticket and 400 are sold. [1]

Examiner only

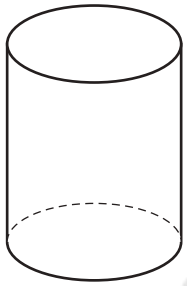
3. (a) Circle **all** the fractions that are **NOT** equal to $\frac{2}{9}$. [2]

$\frac{22}{99}$ $\frac{4}{18}$ $\frac{12}{19}$ $\frac{16}{72}$ $\frac{42}{79}$

(b) Shade $\frac{1}{5}$ of the diagram below. [1]

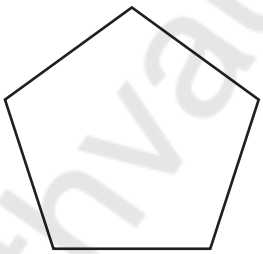
4. Write down the special name of each of the following shapes.

(a)



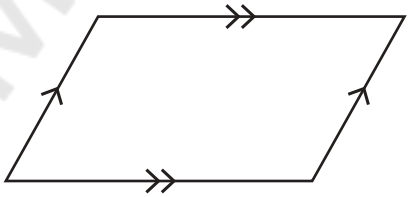
Cylinder [1]

(b)



Pentagon (regular) [1]

(c)



Parallelogram [1]

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5. Find the median of the numbers listed below. [2]

22 13 29 20 17 15 11

11, 13, 15, 17, 20, 22, 29

Ans = 17

6. In the table below, the letters a, b, c and d represent different numbers.
The total for each row is given at the side of the table.
Find the values of a, b, c and d. [4]

a	a	a	a	120
b	a	a	a	107
b	b	c	c	114
a	b	c	d	100

a = ...

b = ...

c = ...

d = ...

$a+a+a+a = 120$; $4a = 120$; $a = \frac{120}{4}$

$\therefore a = 30$

$3a + b = 107$; $b = 107 - 3a$

$b = 107 - 3(30)$

$b = 17$

$2b + 2c = 114$; $2(17) + 2c = 114$

$2c = 114 - 34$; $2c = 80$; $c = 40$

$d = 100 - (30 + 17 + 40) = 13$

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7. (a) What is the special name given to an angle greater than 0° and less than 90°? [1]

Acute Angle

(b) What is the special name of a quadrilateral with rotational symmetry of order four? [1]

Square

8. (a) Describe **in words** the rule for continuing each of the following sequences.

(i) 62, 51, 40, 29, … [1]

Rule:

Subtract "11" from previous term

(ii) 2, 8, 32, 128, … [1]

Rule:

Multiply previous term by "4"

(b) Solve the following equations.

(i) $4x = 124$ [1]

$x = \frac{124}{4} = 31$

(ii) $w + 6{\cdot}9 = 110$ [1]

$w = 110 - 6.9$

$= 103.1$

9. (a) Calculate $\frac{3}{8}$ of 142. [2]

Write your answer as a decimal.

$\frac{3}{8} \times 142 = 53.25$

Examiner only

(b) Evaluate $3{\cdot}4^2 + \sqrt{31{\cdot}36}$. [1]

Write your answer as a decimal.

$11.56 + 5.6$

$= 17.16$

10. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Steve has a bag containing 10 discs.
Some of the discs are red. The others are blue.

If a disc is selected at random, the probability of selecting a red disc is $\frac{2}{5}$.

10 more blue discs are added to Steve's bag.
He now selects one disc at random.

What is the probability that the disc Steve selects is red?
You must show all your working. [3 + 2 OCW]

Initially

red disc $= \frac{2}{5} \times 10 = 4$

Init

$R = 4$; $B = 10 - 4 = 6$; $T = 10$

No $R = 4$; $B = 6 + (10) = 16$; $T = 20$

Probability for Red disc

$= \frac{4}{20}$;

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11. (a)

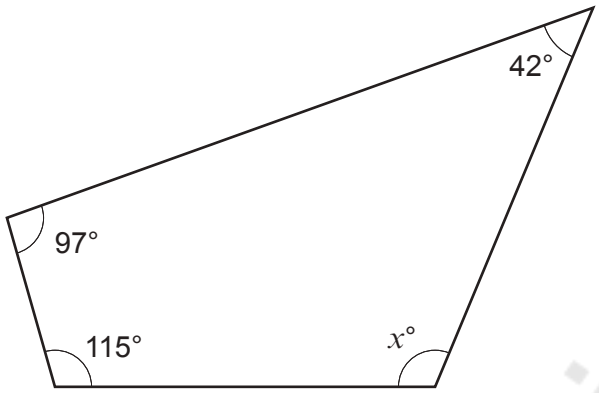

Diagram not drawn to scale

Calculate the value of x. [2]

$x + 115 + 97 + 42 = 360°$

$x = 360 - (115 + 97 + 42)$

$= 360 - (254)$

$= 106°$

(b) The diagram below shows an isosceles triangle.

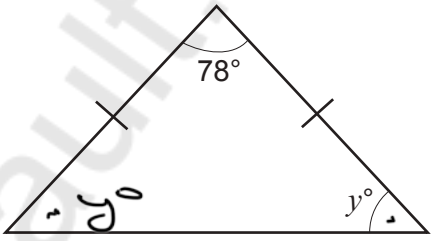

Diagram not drawn to scale

Calculate the value of y. [2]

$y° + y° + 78° = 180$

$2y° + 78 = 180$

$2y = 180 - 78$

$2y = 102$

$y = \frac{102}{2} = 51$

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12. (a) Which **one** of the following fractions can be written as a recurring decimal? Circle your answer. [1]

$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$ $\frac{1}{8}$ $\frac{1}{10}$

1/6

(b) Which **three** numbers from the list below are prime numbers? [2]

27 31 35 39 43 47 51 55

The three prime numbers are:

31 , 43 and 47

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13. Alice is 9 years younger than Isaac.
Nadia is one third of Isaac's age.
Dewi is twice Nadia's age.

Alice is 27 years old.

What are the ages of Isaac, Nadia and Dewi? [3]

$A = I - 9$; $N = \frac{1}{3} I$, $D = 2 \times N$

$27 = I - 9$

$I = 27 + 9$; $I = 36$

$N = \frac{1}{3} \times 36 = 12$

$D = 2 \times 12 = 24$

Isaac is 36 years old. Nadia is 12 years old. Dewi is 24 years old.

14. (a) Write down the next two numbers in the following sequence. [2]

−26 −20 −14 −8 −2 +4

Pattern is a progressive addition of 6

(b) $f = 3g + 2h$.

Calculate the value of f when g = 9·3 and h = −13·6. [2]

$f = 3(9.3) + 2(-13.6)$

$= 27.9 + (-27.2)$

$= 27.9 - 27.2$

$= 0.7$

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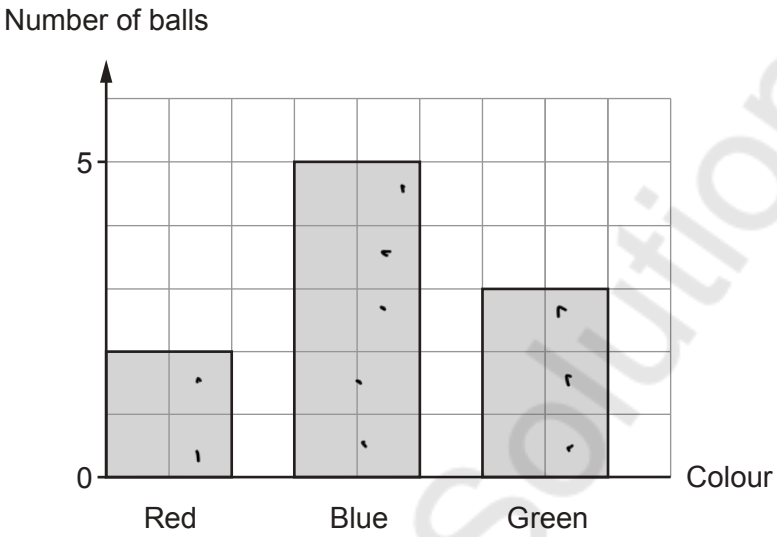
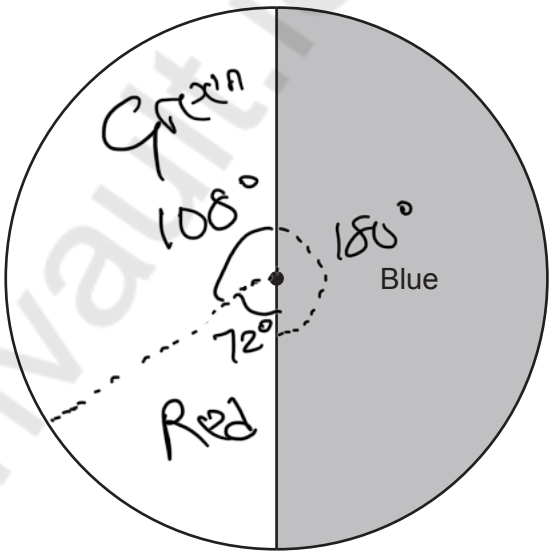
15. A box contains different-coloured balls.
Some are red, some are blue and the others are green.

The bar chart shows how many balls of each colour are in the box.



Draw an accurate pie chart to compare the number of coloured balls in the box.
Part of the pie chart has been completed for you. [3]



$B = 5, R = 2, G = 3 ; T = 10$

$R = \frac{2}{10} \times 360 = 72°$

$G = \frac{3}{10} \times 360 = 108°$

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16. A journey of 45 miles is travelled in 1 hour 15 minutes.
Calculate the average speed of this journey.
Give your answer in mph. [3]

$S = \frac{D}{t}$; 60min = 1hr

∴ 15m. = x

$x = \frac{15}{60} = \frac{1}{4}$

1hr 15min = $1\frac{1}{4}$ hr

$45 \div \frac{5}{4}$; $4.5 \div 1.25$

= 36mph

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17. A solid metal cuboid has dimensions 4 cm, 5 cm and 20 cm.

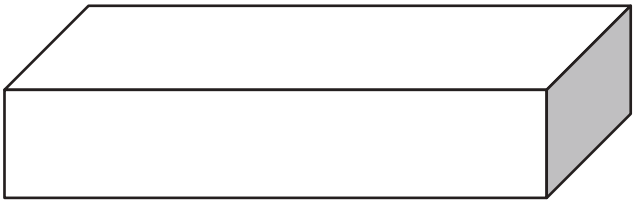

Diagram not drawn to scale

The cuboid is melted down. The metal is used to make solid cubes, each with sides 3 cm.

How many complete cubes will be made?
You must show all your working. [5]

Vol of cuboid = $l \times b \times h = 4 \times 5 \times 20$

$= 400 cm^3$

Vol of cube = $l \times b \times h = 3 \times 3 \times 3$

$= 27$

No of cubes possible = $\frac{\text{Vol of cuboid}}{\text{Vol of cubes}}$

$= \frac{400 cm^3}{27 cm^3} = 14.8$

$= 14$

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18. (a)

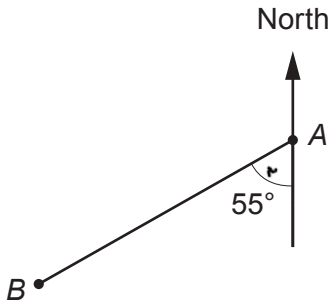


Diagram not drawn to scale

(i) What is the bearing of point *B* from point *A*? [1]

180° + 55° = 235°

(ii) What is the bearing of point *A* from point *B*? [1]

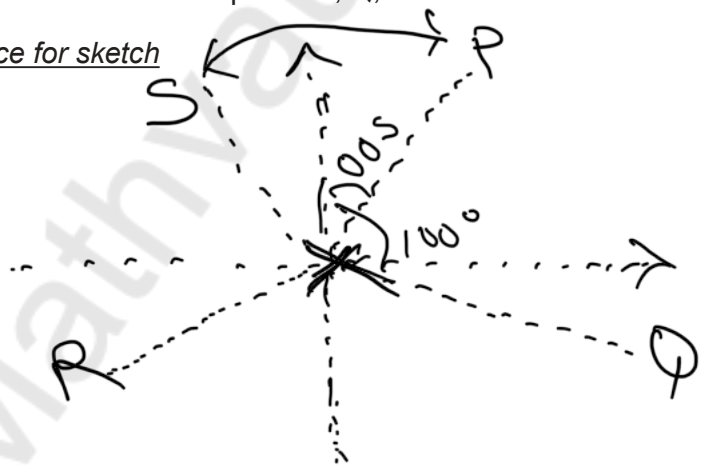
055°

(b) Points *P*, *Q*, *R* and *S* are all 5 km from point *X*.

P is on a bearing of 005° from *X*.
Q is on a bearing of 100° from *X*.
R is on a bearing of 240° from *X*.
S is on a bearing of 355° from *X*.

Which **two** of the four points *P*, *Q*, *R* and *S* are closest to each other? [1]

Space for sketch



The two points closest to each other are S and P.

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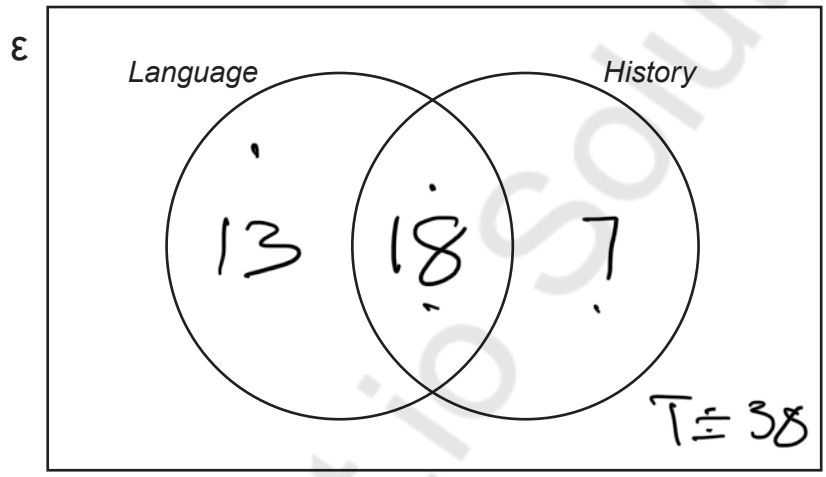
19. A bus going to a *Welsh Heritage* conference has 43 people on board.
There are 38 students, 4 tutors and a driver on the bus.

At the conference, each student will attend a session on *Language*, a session on *History* or both sessions.

- All the students will attend at least one session.
- 18 students will attend both sessions.
- 25 students will attend the session on *History*.
- The tutors and driver will not attend either of the sessions.

(a) Complete the Venn diagram below to show this information.
The universal set, **ε**, contains all of the 43 people on the bus. [3]



$25 - 18 = 7$

$38 - (18 + 7)$

$38 - 25 = 13$

(b) One of the people on the bus is chosen at random.
What is the probability that this person will attend the session on *Language*? [2]

Language = $13 + 18$

$= 31$

Probability = $\frac{31}{38}$

END OF PAPER

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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