Please write clearly, in block capitals.

Centre number ☐☐☐☐☐   Candidate number ☐☐☐☐

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
MATHEMATICS

F

Foundation Tier   Paper 1 Non–Calculator

Exam Date   Morning   Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

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 outside the box around each page or 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.

8300/1F

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

1   Circle the number that is **not** a multiple of 6

[1 mark]

24   76   108   144

2   Which symbol makes this statement correct?

0.062 _____ 0.52

Circle your answer.

[1 mark]

=   <   >   ⩾

3   Solve $x - 7 = 56$

Circle your answer.

[1 mark]

$x = 8$ $x = 49$ $x = 56$ $x = 63$

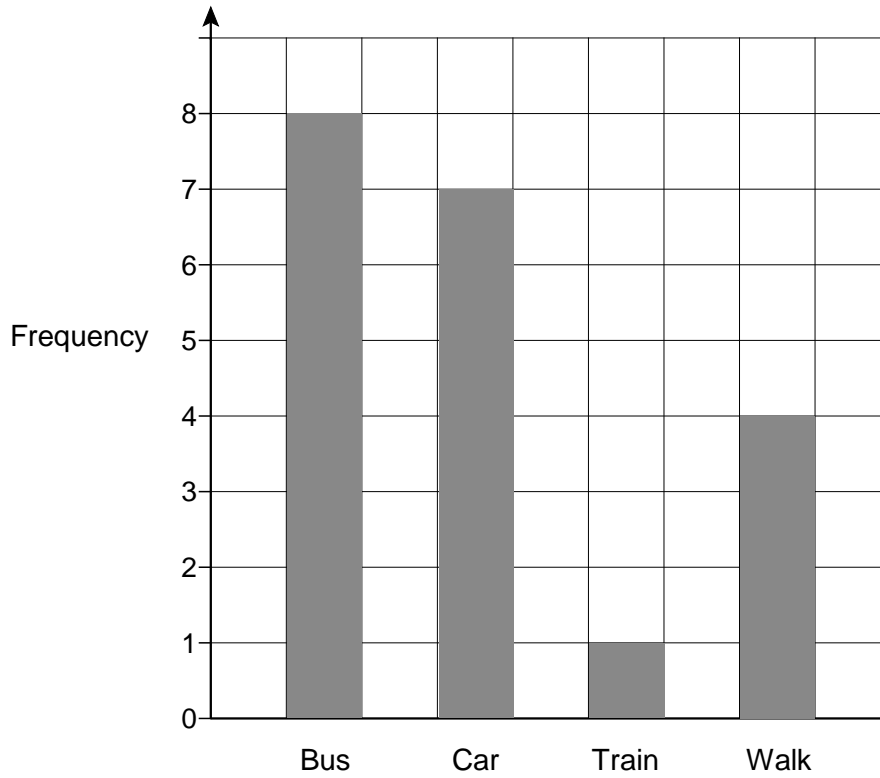**4** Circle the expression that can be written as $2y^2$

[1 mark]

$(2y)^2$ $\qquad$ $2 \times 2 \times y$ $\qquad$ $2 \times y \times y$ $\qquad$ $2 \times 2 \times y \times y$

**Turn over for the next question**

[1 mark]

5 The bar chart shows information about how 20 students travel to school.

Show the information in a pictogram.

Use the key given.

[3 marks]

Key : ◯ represents 2 students

Bus	
Car	
Train	
Walk	

6 (a) Work out $\dfrac{3}{5}$ of 200

[2 marks]

Answer _____

6 (b) Work out $25.8 + 12.6 \div 2$

[2 marks]

Answer _____

7 Simplify $7a + 5b + 3a - 2b$

[2 marks]

Answer _____

8 A bag contains red counters and blue counters in the ratio 3 : 5

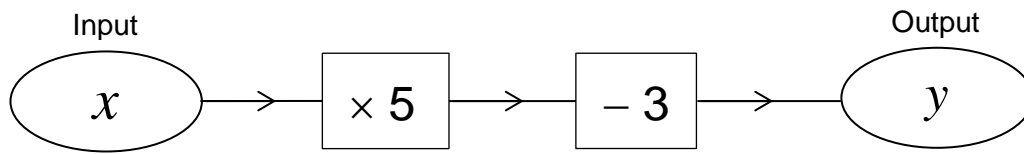What fraction of the counters are red?

Circle your answer.

[1 mark]

$\dfrac{1}{3}$ $\qquad$ $\dfrac{3}{5}$ $\qquad$ $\dfrac{3}{8}$ $\qquad$ $\dfrac{5}{8}$

9 Here is a number machine.

Input   Output

x → $\times 5$ → -3 → y

9 (a) Work out the **output** when the input is 12

[1 mark]

Answer _____

9 (b) Work out the **input** when the output is 27

[2 marks]

Answer _____

9 (c) Write y as an expression in terms of x.

[1 mark]

Answer _____

10 In a quiz, teams are asked 20 questions.

Teams score

       3 points for a correct answer

       0 points for questions not attempted

      −2 points for an incorrect answer.

10 (a) Team A has these results.

	Correct	**Not attempted**	**Incorrect**
Number of questions	12	5	3

Work out the total number of points Team A scores.

[2 marks]

Answer _____

10 (b) Team B answers 16 out of 20 questions correctly.

Work out the percentage of questions Team B answers correctly.

[2 marks]

Answer _____ %

10 (c) After 17 questions, Team C has 35 points.

After 20 questions, Team C has 34 points.

How many of the last three questions are answered correctly, not attempted or answered incorrectly?
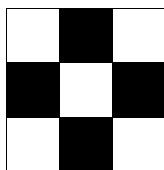
[2 marks]

Correct _____
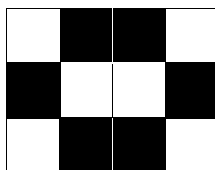
Not attempted _____

Incorrect _____

Turn over for the next question

11 A sequence of patterns uses black squares and white squares.
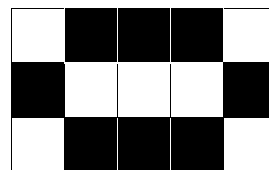
Here are the first three patterns.

Pattern 1   Pattern 2   Pattern 3

11 (a) Circle the expression for the number of black squares in Pattern n.

[1 mark]

$4n$ $n + 2$ $6n - 2$ $2n + 2$

11 (b) Will the number of black squares always be even?

Tick a box.

Yes ☐   No ☐

Give a reason for your answer.

[1 mark]

_____

_____

12 82 children visit a sports centre.

50 of the children swim.

At least one adult is needed for every 12 children who swim.
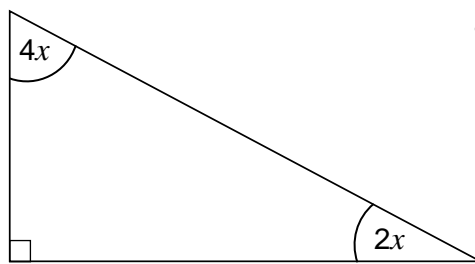
The other 32 children dance.

At least one adult is needed for every 15 children who dance.

Work out the **minimum** number of adults needed for the 82 children.

[4 marks]

Answer _____

13 Work out the value of x.

Not drawn accurately

[3 marks]

Answer _____ degrees

14 (a) The sum of two square numbers is 180

What are the **two** square numbers?

[2 marks]

_____

_____

Answer _____ and _____

14 (b) Kim says,

"The sum of any two **different** square numbers is **always** even."

Is she correct?

Write down a calculation to support your answer.

[1 mark]

_____

_____

15   A piano competition takes place every 3 years.

          A violin competition takes place every 4 years.

          Both competitions took place in 2009

15 (a)   In which of these years did the **violin** competition take place?

          Circle your answer.

                                                                                            [1 mark]

                1992   1993   1994   1995

15 (b)   When is the next year after 2009 that **both** competitions will take place?

                                                                                           [1 mark]

                                 Answer _____

15 (c)   In any leap year, the number made by the last two digits is divisible by 4

          For example, 1996 and 2004 were leap years because 96 and 04 are divisible by 4

          Give a reason why the violin competition will **never** take place in a leap year.

                                                                                           [1 mark]
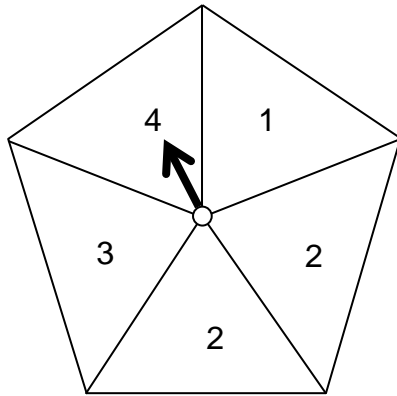
16   Work out the value of $4(2x + 3y)$ when $x = 8$ and $y = -3$

[2 marks]

Answer _____

17   Factorise $15x + 35y - 40z$

[1 mark]

Answer _____

18 Joanne has a fair five-sided spinner.

18 (a) Write down the probability of scoring a 4 with one spin.
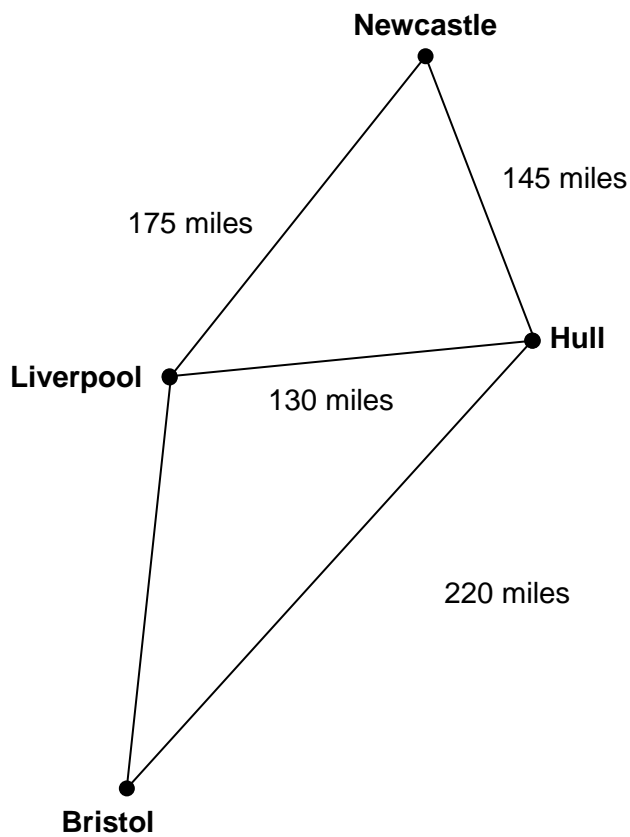
[1 mark]

Answer _____

18 (b) Work out the probability of scoring a **total** of 4 with two spins.

[3 marks]

Answer _____

19 The diagram shows distances by road between four cities.

Not drawn accurately

Newcastle

145 miles

175 miles

Liverpool

130 miles

Hull

220 miles

Bristol

19 (a) Sam drives from Newcastle to Hull, and then from Hull to Bristol.

Tim drives from Newcastle to Liverpool, and then from Liverpool to Bristol.

Sam drives 10 **more** miles than Tim.

Work out the distance by road from Liverpool to Bristol.

[3 marks]

Answer _____ miles

19 (b)   Rob is going to drive 130 miles from Hull to Liverpool.

There are road works for 25 miles of the journey.

He assumes his average speed will be

    50 mph where there are road works

    70 mph for the rest of the journey.

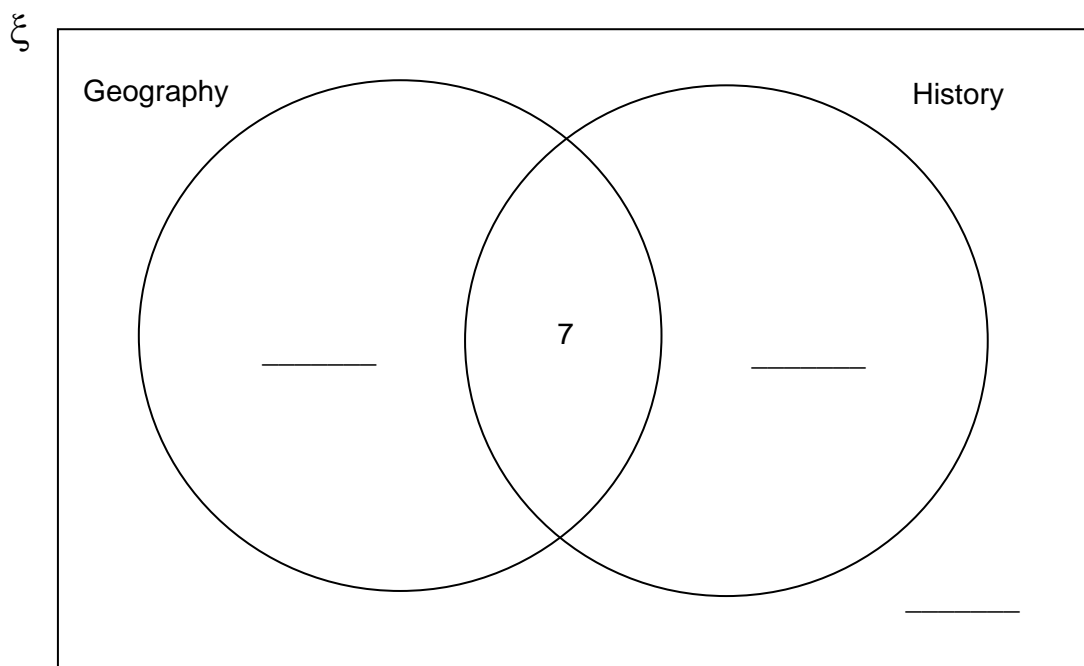Using his assumptions, work out his journey time.

[4 marks]

Answer _____

19 (c)   Rob's assumptions about his average speeds are too high.

How does this affect his journey time?

[1 mark]

20   50 students are asked if they study Geography or History.

The Venn diagram shows some information about their answers.

20 (a)   What does the number 7 on the diagram represent?

[1 mark]

_____

_____

20 (b)   20 students study Geography but **not** History.

19 students study History.

Complete the Venn diagram.

[3 marks]

21 Here are the instructions on a bottle of fruit squash.

To make fizzy juice
mix 2 parts fruit squash
with 7 parts lemonade

21 (a) How much fruit squash is needed to make 450 ml of fizzy juice?

[2 marks]

Answer _____ ml

21 (b) Tom has 80 ml of fruit squash.

He also has 210 ml of lemonade.

What is the **maximum** amount of fizzy juice he can make?

[3 marks]

Answer _____ ml

22 Four identical circles just fit inside a square as shown.

← 12 cm →
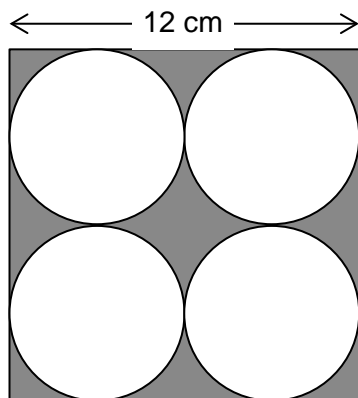
Not drawn accurately

Work out the area of the shaded section.

Give your answer in terms of π.

[4 marks]

Answer _____ cm²

23 Bag A contains 10 blue balls and 20 red balls.

Bag B contains 8 blue balls and 12 red balls.

A ball is chosen at random from each bag.

Jo says,

"It is more likely that a blue ball is chosen from Bag A than Bag B because there are more blue balls in Bag A."

Is she correct?

You **must** show your working.

[3 marks]

24 Which of these has the greatest value?

Circle your answer.

[1 mark]

6.15×10^4 61 499 6.2×10^3 61.6×10^3

25 Jack works out the answer to $\dfrac{\sqrt{98.5} - 12.1}{-0.8}$

He says the answer is negative.

Is he correct?
You **must** show your working.

[2 marks]

26 A ball is dropped from a height of 50 metres.

After each bounce, the ball reaches 20% of its previous height.

How high does it reach after the second bounce?

[2 marks]

Answer _____ metres

27 Use a ruler and a pair of compasses in this question.
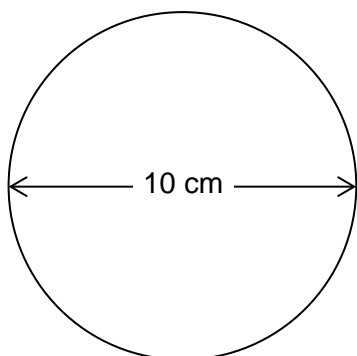
Construct the perpendicular bisector of *AB*.

[2 marks]

B

A
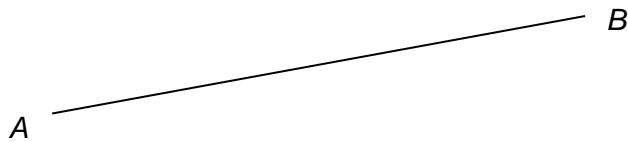
Turn over for the next question

Turn over ▶

28 A circle has diameter 10 cm

A square has side length 6 cm

Not drawn accurately

10 cm

6 cm

Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

[3 marks]

END OF QUESTIONS