GCSE Mathematics Practice Tests: Set 22

Paper 2F/3F (Calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.

- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 94
- Questions are in order of mean difficulty as found by students achieving Grade 4.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question*.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   Find the value of

(a) $\sqrt{31.36}$

....

(1)

(b) 14^3

....

(1)

(Total for Question 1 is 2 marks)

2   Jordan buys 256 notebooks.

He buys the notebooks in packs of 8 notebooks.
Each pack of 8 notebooks costs £2.48

Work out how much the 256 notebooks cost Jordan.

£..

(Total for Question 2 is 3 marks)

3   Brigid recorded the distance she ran on each of three days.

The table shows her results.

Day	Distance
Monday	5950 m
Tuesday	14.5 km
Wednesday	9000 m

Brigid set herself the target of running a **total** of at least 30 km on these three days.

Show that Brigid did not achieve her target.

(Total for Question 3 is 3 marks)

4   Jakub has bought a chicken.

He is going to use this rule to work out the number of minutes it will take to cook his chicken.

> **Cooking time (minutes)**
>
> Multiply the chicken's weight, in kg, by 40
> **Then add**
> 30

The weight of Jakub's chicken is 2.6 kg

(*a*) Use the rule to work out the number of minutes it will take to cook Jakub's chicken.

.... minutes

(2)

The following week Jakub buys another chicken.

He uses the rule and works out that it will take 2 hours 40 minutes to cook this chicken.

(*b*) Work out the weight of this chicken.

.... kg

(3)

(Total for Question 4 is 5 marks)

5   Work out the value of

$$\frac{15.2 \times 4.1}{8 - \sqrt{3.7}}$$

Write down all the figures on your calculator display.

....

(Total for Question 5 is 2 marks)

6 $Q = 5v^2 - w$

Work out the value of Q when $v = \dfrac{1}{2}$ and $w = \dfrac{1}{4}$

$Q = $ ....

`**(Total for Question 6 is 2 marks)**

7 The diagram shows a trapezium.
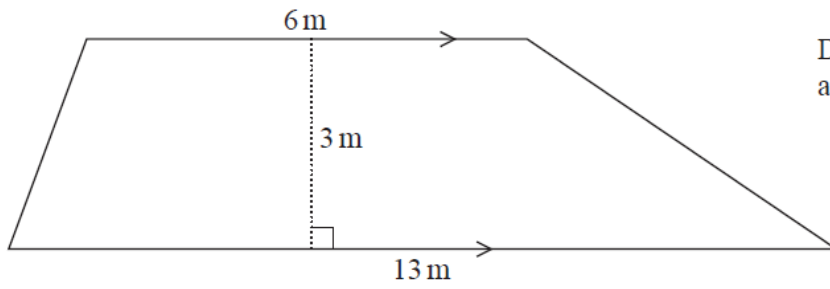
Diagram **NOT** accurately drawn

Work out the area of the trapezium.

.... m^2

(Total for Question 7 is 2 marks)

8 Here are the first five terms of a number sequence.

<div align="center">1   7   13   19   25</div>

(a) (i) Write down the next term of the sequence.

....

(1)

    (ii) Explain how you worked out your answer.

....

(1)

(b) Explain why 188 cannot be a number in the sequence.

....

....

(1)

(Total for Question 8 is 3 marks)

9 The table gives information about the population, correct to 2 significant figures, of each of five cities in 2018

City	Population (2018)
Ahmedabad	7.7×10^6
Barcelona	5.5×10^6
Chicago	8.8×10^6
Lagos	1.3×10^7
Tokyo	3.7×10^7

(a) Write 8.8×10^6 as an ordinary number.

....
(1)

(b) Which of these cities had the least population in 2018?

....
(1)

(c) Work out the difference between the population of Tokyo and the population of Ahmedabad in 2018
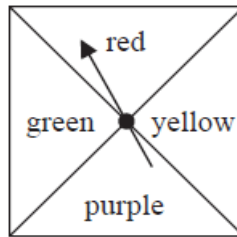Give your answer in standard form correct to 2 significant figures.

....
(2)

(Total for Question 9 is 4 marks)

10 Sophia spends a total of £6.30 on cheese.

She buys 500 g of Cheddar cheese and 200 g of Stilton cheese.

The cost of the Cheddar cheese is £9.20 for 1 kg.

Work out the cost of 1 kg of the Stilton cheese.

£..

(Total for Question 10 is 4 marks)

11 Here is a biased spinner.

When the spinner is spun once, the probabilities that it lands on red or on yellow or on green are given in the table.

Colour	red	yellow	purple	green
Probability	0.25	0.2	0.2	

(*a*) Work out the probability that the spinner lands on red or on yellow.

....

(1)

Yang is going to spin the spinner 300 times.

(*b*) Work out an estimate for the number of times the spinner will land on purple.

....

(3)

(Total for Question 11 is 4 marks)

12 Here is a list of seven numbers.

$$5 \quad 16 \quad 23 \quad 27 \quad 50 \quad 160 \quad 240$$

(*a*) From the numbers in the list, write down

(i) a cube number

....
(1)

(ii) a factor of 80

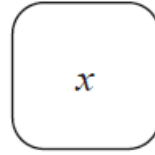..
(1)

Two numbers in the list are prime numbers.

(*b*) Work out the sum of these two prime numbers.

....
(2)

(Total for Question 12 is 4 marks)

13 Here are five cards.

Each card has a number written on it.

| 15 | 7 | −2 | 23 | x |
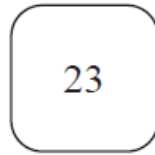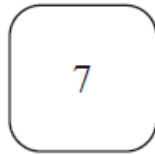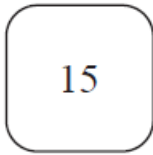
The mean of the five numbers is 12

Work out the value of x

$x =$ ....

(Total for Question 13 is 3 marks)

14 Salma asked some people what type of exercise they each liked the best from walking or running or swimming or cycling.

Salma is going to draw a pie chart for her results.

The incomplete table gives some information about her results.

Type of exercise	Number of people	Angle in pie chart
Walking	18	90°
Running		150°
Swimming		
Cycling	15	

18 people answered walking.

(a) How many people answered running?

....

(2)

15 people answered cycling.

(b) How many people answered swimming?

....

(3)

(Total for Question 14 is 5 marks)

**15** It takes a machine 8 seconds to produce a bolt.

Each day, the machine starts producing bolts at 09 30
The machine produces bolts continuously every 8 seconds until it stops at 16 10 on the same day.

Work out how many bolts the machine produces each day.

....

(Total for Question 15 is 4 marks)

16 Molly uses this number machine to work out the amount of tax that she has to pay on the money she earns.

Number of hours worked → multiply by 12 → add 50 → multiply by 0.2 → Amount of tax to be paid in £
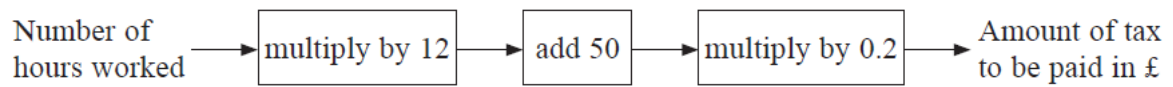
When Molly works n hours the amount of tax she has to pay is £T

Find a formula for T in terms of n

....

(Total for Question 16 is 3 marks)

17   Jane bought a new car for £18 000
The car depreciates in value by 15% each year.

Work out the value of the car at the end of 4 years.
Give your answer correct to the nearest £

£..

(Total for Question 17 is 3 marks)

18 Write 1200 as a product of powers of its prime factors.
Show your working clearly.

....

(Total for Question 18 is 3 marks)

19 The language department of a college has 180 students.
Each student studies exactly one of French, German, Italian or Spanish.

15 students study French.
45% of the students study German.

Express the percentage of students studying Italian or Spanish as a percentage of those studying French or German.

....%

(Total for Question 19 is 4 marks)

20 Kim spends £N
Of this, she spends

   40% on food

   $\dfrac{1}{4}$ on clothes

   and the rest on petrol

Kim spends £P on petrol.

Work out the ratio $P : N$ in the form $a : b$ where a and b are integers.
Give your answer in its simplest form.

....

(Total for Question 20 is 4 marks)

21 Bella and Millie share some money in the ratio 5 : 2

Bella receives £10.50 more than Millie.

Work out the total amount of money they share.

£..

(Total for Question 21 is 3 marks)

22 Alberto, Bill, Candela and Diana are four friends.

Here is some information about the height of each of these friends.

Alberto's height is 158 cm.
Bill's height is 175 cm.
Candela's height is greater than Diana's height.

The median height of these four friends is 160 cm.
The range of the heights of these four friends is 21 cm.

Work out Candela's height and Diana's height.

Candela .... cm

Diana .... cm

(Total for Question 22 is 3 marks)

23 The diagram shows a shape made from a square *ABCD* and 4 identical semicircles.
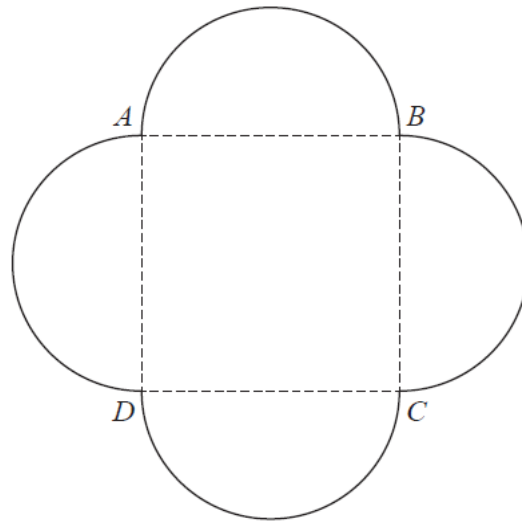

Diagram **NOT** accurately drawn

As shown in the diagram, the semicircles have *AB*, *BC*, *CD* and *DA* as diameters.

The area of the square is 36 cm^2

Calculate the total area of the shape.
Give your answer correct to one decimal place.

.... cm^2

(Total for Question 23 is 4 marks)

24 The diagram shows a solid cylinder made from iron.
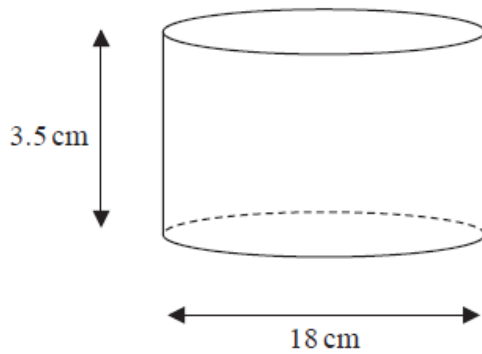
Diagram **NOT** accurately drawn

3.5 cm

18 cm

The cylinder has diameter 18 cm and height 3.5 cm
The mass of the cylinder is 7.04 kg

Work out the density of the iron.
Give your answer in g/cm^3 correct to 2 significant figures.

.... g/cm^3

(Total for Question 24 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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