

GCSE Mathematics

Practice Tests: Set 23

Paper 2H/3H (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 80
- Questions are in order of mean difficulty as found by students achieving Grade 7.
- 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 ONE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** (a) Write 6.25×10^{-4} as an ordinary number.

.....
(1)

- (b) Work out $(2.4 \times 10^{12}) \div (9.6 \times 10^4)$
Give your answer in standard form.

.....
(2)

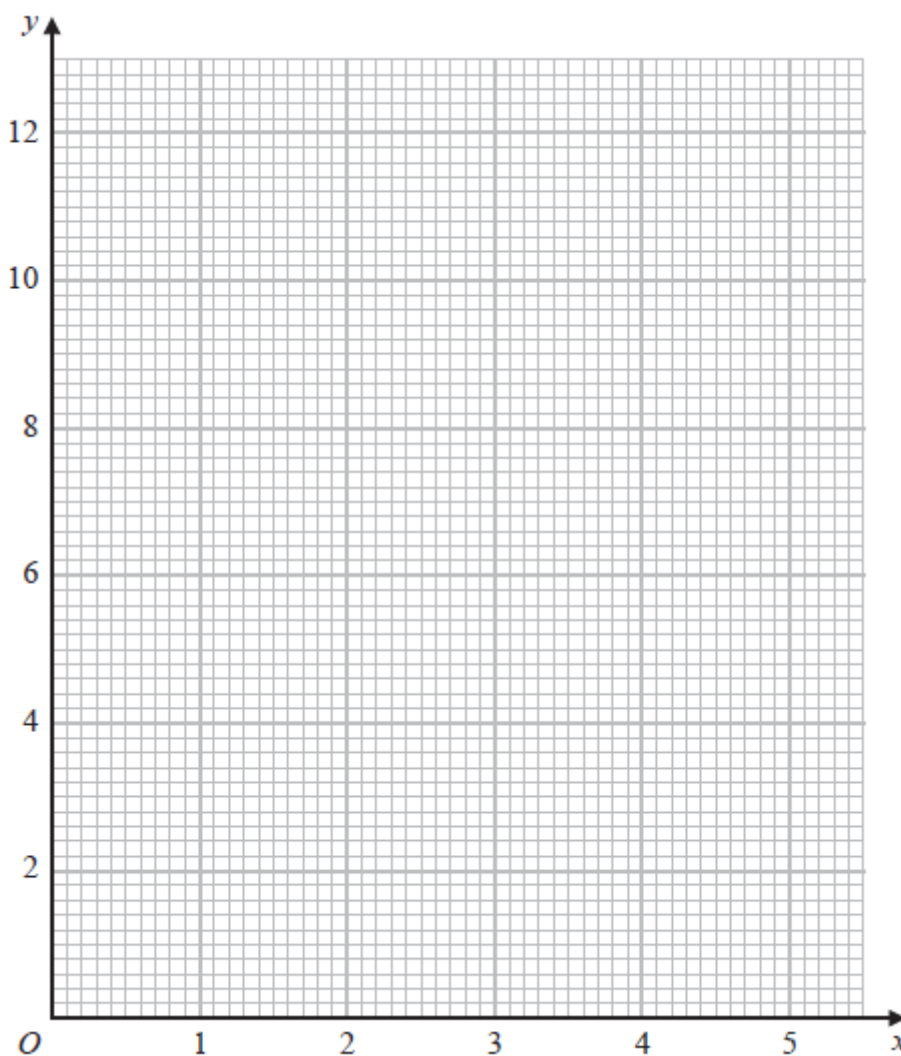
(Total for Question 1 is 3 marks)

2 (a) Complete the table of values for $y = \frac{2}{x} \left(5 - \frac{1}{x} \right)$

x	0.5	1	2	3	4	5
y	12			3.1	2.4	1.9

(1)

(b) On the grid, draw the graph of $y = \frac{2}{x} \left(5 - \frac{1}{x} \right)$ for $0.5 \leq x \leq 5$



(2)

(Total for Question 2 is 3 marks)

3 The diagram shows a pentagon.

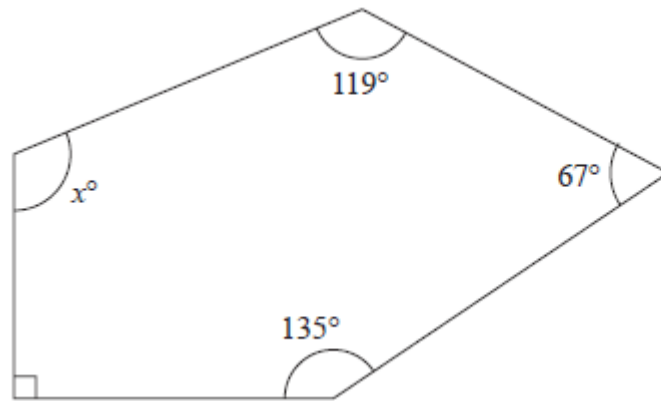


Diagram NOT accurately drawn

Work out the value of x

$x = \dots\dots\dots$

(Total for Question 3 is 3 marks)

- 4 Some members of a library were asked to name the type of book that they each liked to read the best.

One of the members is chosen at random.

The table shows information about the probability of the type of book that this member answered.

Type of book	comedy	romance	mystery	thriller
Probability	0.24	0.40	$3x$	x

48 members answered comedy books.

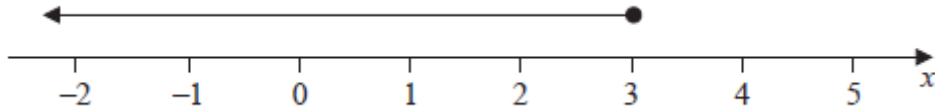
Work out how many of the members answered mystery books.

.....
(Total for Question 4 is 4 marks)

5 (a) Factorise $y^2 - 2y - 48$

.....
(2)

(b) Write down the inequality shown on the number line



.....
(1)

(c) Solve the inequality $7w + 6 > 12w + 14$

.....
(3)

(Total for Question 5 is 6 marks)

- 6 Matteo is going to invest £5000 for two years.
He can invest his money in Bank **G** or in Bank **H**.

Bank G
1.6% per year
compound interest

Bank H
2.9% interest added after
two years

The total amount of interest Matteo would receive at the end of two years from Bank **G** is more than the amount of interest Matteo would receive at the end of two years from Bank **H**.

How much more?

£.....

(Total for Question 6 is 4 marks)

7 Shane bought a car.

The amount Shane paid for the car was £32 000

Theresa also bought a car. To pay for this car, Theresa paid a deposit of £18 000 together with 14 monthly payments of £1160

Theresa paid more for her car than Shane paid for his car.

(a) Work out how much more Theresa paid as a percentage of the amount Shane paid.

.....%
(4)

Kylie bought a van.

After 1 year, the value of the van was £39 865

During this year, the value of the van decreased by 15%

(b) Work out the value of the van when Kylie bought it.

£.....
(3)

(Total for Question 7 is 7 marks)

- 8 Change a speed of 90 kilometres per hour to a speed in metres per second.
Show your working clearly.

..... m/s

(Total for Question 8 is 3 marks)

9 Solve $\frac{x+3}{4} - \frac{7-x}{5} = 4.3$

Show clear algebraic working.

$x = \dots\dots\dots$

(Total for Question 9 is 3 marks)

- 10** Given that the surface area of a sphere is $49\pi \text{ cm}^2$, find the volume of the sphere.
Give your answer correct to the nearest integer.

..... cm^3
(Total for Question 10 is 3 marks)

- 11** 80 students entered a dancing competition.
The table gives information about the length of time, in minutes, for which each student spent dancing.

Frequency	Time (m)
$0 < m \leq 12$	11
$12 < m \leq 24$	25
$24 < m \leq 36$	23
$36 < m \leq 48$	15
$48 < m \leq 60$	6

Work out an estimate for the mean length of time the students spent dancing.

..... minutes

(Total for Question 11 is 4 marks)

12 The diagram shows rectangle $ABCD$

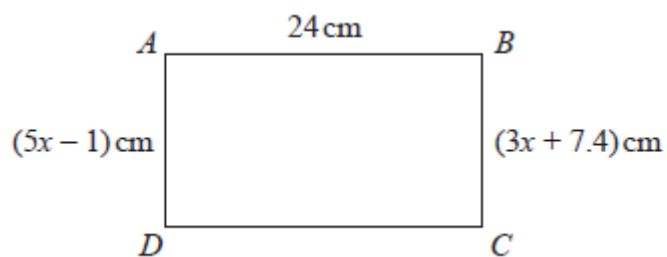


Diagram NOT accurately drawn

Work out the perimeter of the rectangle.
Show your working clearly.

..... cm

(Total for Question 12 is 4 marks)

13 The weight of a cake is 2.75 kg, correct to 2 decimal places.

(a) Write down the lower bound of the weight of the cake.

..... kg
(1)

(b) Write down the upper bound of the weight of the cake.

..... kg
(1)

Penny has worked out $\frac{81.3 \times 59.2}{1.9^2}$.

Her answer is 13 332.299 17

Penny's answer is not sensible.

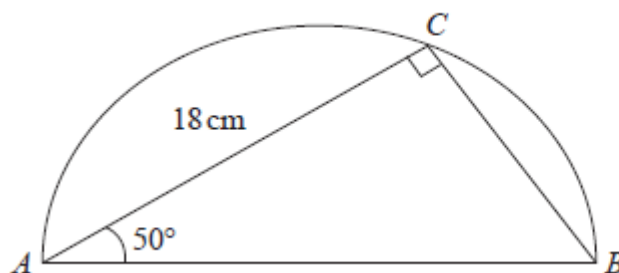
(c) By rounding each number to one significant figure, work out a suitable estimate to show that her answer is not sensible.
Show your working clearly.

(2)

(Total for Question 13 is 4 marks)

14 The diagram shows a triangle ABC inside a semicircle.

Diagram NOT
accurately drawn



A , B and C are points on the semicircle.

AB is the diameter of the semicircle.

Angle $ACB = 90^\circ$

Angle $BAC = 50^\circ$

$AC = 18$ cm

Work out the perimeter of the semicircle.

Give your answer correct to 2 significant figures.

..... cm

(Total for Question 14 is 5 marks)

15 In a box, there are only green sweets, orange sweets and yellow sweets.

There are 280 sweets in the box so that

the number of green sweets : the number of orange sweets = 2 : 3

and

the number of orange sweets : the number of yellow sweets = 1 : 5

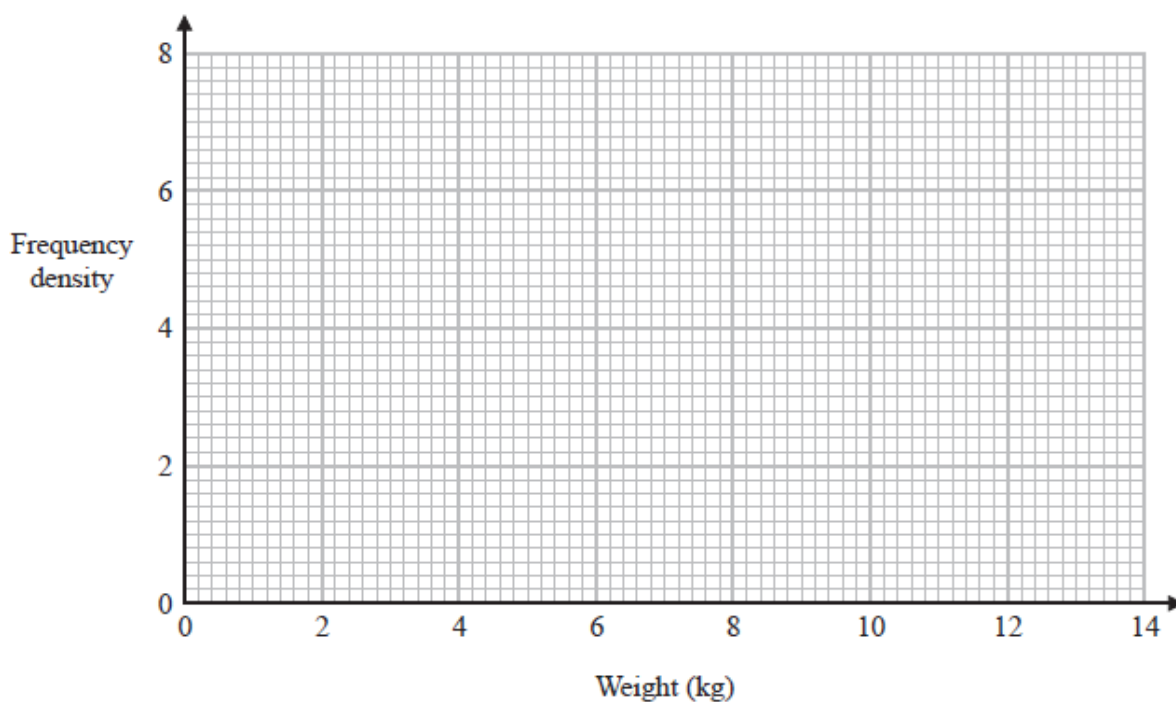
Work out how many green sweets there are in the box.

.....
(Total for Question 15 is 3 marks)

- 16 The table gives information about the weights, in kg, of the parcels that Pedro delivers on Monday.

Weight (w kg)	Frequency
$0 < w \leq 2$	12
$2 < w \leq 3$	7
$3 < w \leq 6$	15
$6 < w \leq 9$	12
$9 < w \leq 14$	9

- (a) On the grid, draw a histogram for this information.



(3)

One of the parcels that Pedro delivered on Monday is chosen at random.

- (b) Using the information in the table, find an estimate for the probability that this parcel weighs more than 7 kg.

.....
(2)

(Total for Question 16 is 5 marks)

- 17** The points A and B are on a coordinate grid.
The coordinates of A are $(6, 4)$
The coordinates of B are $(17, j)$ where j is a constant.
The midpoint of AB has coordinates $(k, 15)$ where k is a constant.
Find the value of j and the value of k

$j = \dots\dots\dots$

$k = \dots\dots\dots$

(Total for Question 17 is 3 marks)

- 18** Here is a list giving the numbers of runs scored last week by the eleven members of cricket team **A**.

2 3 4 6 21 26 27 32 34 61 72

The interquartile range of the numbers of runs scored last week by the eleven members of cricket team **B** was 42

Using a suitable calculation, write down one comparison between the numbers of runs scored by the members of cricket team **A** and the members of cricket team **B**.
Show your working clearly.

.....
.....

(Total for Question 18 is 3 marks)

19 The acceleration, a , of an object is given by

$$a = \frac{v - u}{t}$$

where

$v = 45.23$ correct to 2 decimal places

$u = 5.12$ correct to 2 decimal places

$t = 8.5$ correct to 2 significant figures

By considering bounds, work out the value of a to a suitable degree of accuracy.
Show your working clearly and give a reason for your answer.

$a = \dots\dots\dots$

(Total for Question 19 is 5 marks)

20 The diagram shows the cross section of a circular water pipe.

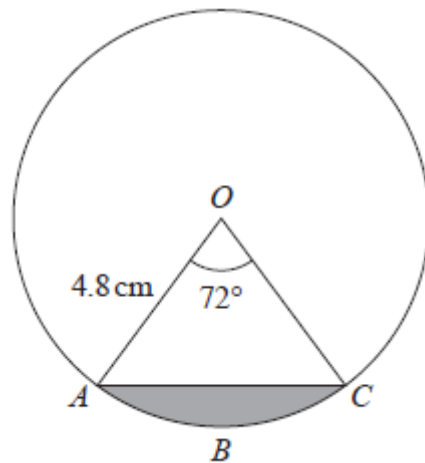


Diagram NOT accurately drawn

OAC is a sector of the circle, centre O

The shaded region in the diagram represents the water flowing in the pipe.

The water flows at 14 cm/s in the pipe.

Work out the volume of water that has flowed through the pipe in 3 minutes.

Give your answer in cm^3 correct to 3 significant figures.

..... cm³

(Total for Question 20 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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