GCSE Mathematics Practice Tests: Set 15

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 not 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
- 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 questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Harold bought an antique clock for £1200
The clock increased in value by 8% per year.

Find the value of the clock exactly 3 years after Harold bought the clock.
Give your answer correct to the nearest £.

£.....

(Total for Question 1 is 3 marks)

2 Pedro drove from Toulouse to Montpellier in 2 hours 42 minutes.
He drove at an average speed of 90 km/hour.

Janine drove from Toulouse to Montpellier along the same route as Pedro.
The journey took her 3 hours.

Work out Janine's average speed for the journey.

..... km/hour

(Total for Question 2 is 4 marks)

3 Alex makes 80 cakes to sell.
He makes chocolate cakes, lemon cakes and fruit cakes where

$$\begin{array}{ccccccc} \text{number of} & & \text{number of} & & \text{number of} & & \\ \text{chocolate cakes} & : & \text{lemon cakes} & : & \text{fruit cakes} & : & = 3 : 2 : 5 \end{array}$$

Alex sells

all of the chocolate cakes

$\frac{3}{4}$ of the lemon cakes

$\frac{7}{8}$ of the fruit cakes

The profit he makes on each cake he sells is shown in the table.

Type of cake	**Profit per cake he sells**
chocolate	£2.00
lemon	£1.70
fruit	£2.40

Work out the total profit that Alex makes from the cakes he sells.

£.....

(Total for Question 3 is 5 marks)

4 In 2017, the population of a village was 7500
In 2019, the population of the village was 8265

Work out the percentage increase in the population of the village from 2017 to 2019

….....%

(Total for Question 4 is 3 marks)

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5 Platinum nuggets are in the shape of a solid cylinder.

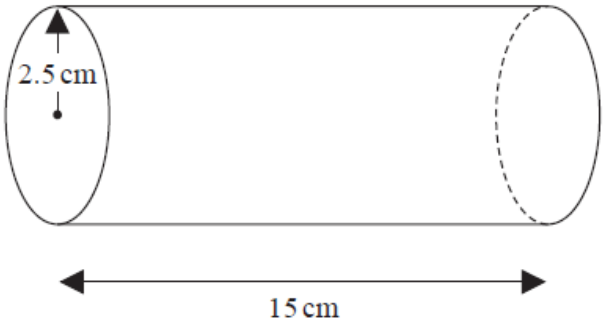


Diagram **NOT** accurately drawn

The radius of each cylinder is 2.5 cm.
The length of each cylinder is 15 cm.

The density of platinum is 21.5 g/cm3

The greatest mass that Jacques can carry is 30 kg.

Can Jacques carry 5 platinum nuggets at the same time?
You must show all your working.

(Total for Question 5 is 5 marks)

6 Alison buys 2 boxes of strawberries, box **A** and box **B**.

Box **A** contains 15 strawberries.
The strawberries in box **A** have a mean weight of 24 grams.

Box **B** contains 25 strawberries.
The strawberries in box **B** have a mean weight of 18 grams.

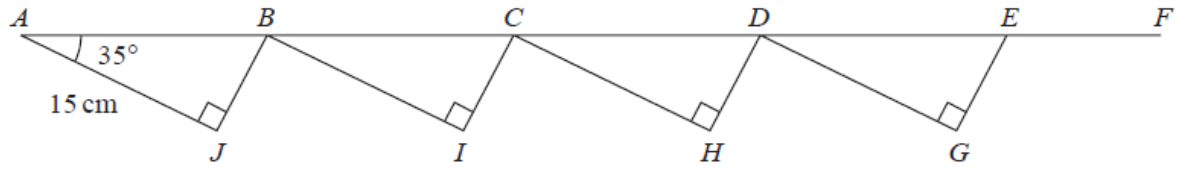
Alison puts all 40 strawberries into a bowl.
Work out the mean weight of the 40 strawberries.

..... grams

(Total for Question 6 is 3 marks)

7 The diagram shows four congruent right−angled triangles *ABJ*, *BCI*, *CDH* and *DEG*.
The diagram also shows the straight line *ABCDEF*.

Diagram **NOT** accurately drawn



AJ = 15 cm
Angle *BAJ* = 35°

AF = 80 cm

Work out the length of *EF*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 7 is 5 marks)

8 The table gives information about the length of time, in minutes, that each of 60 students took to travel to school on Monday.

Length of time (t minutes)	**Frequency**
$0 < t \leq 10$	4
$10 < t \leq 20$	10
$20 < t \leq 30$	15
$30 < t \leq 40$	25
$40 < t \leq 50$	6

(*a*) Write down the modal class interval.

.....

(1)

(*b*) Work out an estimate for the mean length of time taken by these 60 students to travel to school on Monday.
Give your answer correct to one decimal place.

..... minutes

(4)

(Total for Question 8 is 5 marks)

9 Find the gradient of the straight line with equation $5x + 2y = 7$

.....

(Total for Question 9 is 2 marks)

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10 Markus makes a steel framework.
The framework is in the shape of the right−angled triangle ABC shown in the diagram.

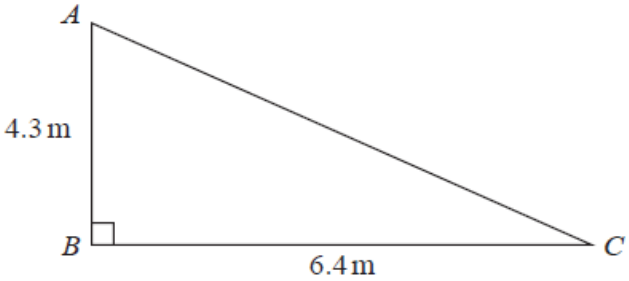

Diagram **NOT** accurately drawn

The steel that Markus uses costs $22 per metre.
The steel can **only** be bought in a length that is a whole number of metres.

Work out the total cost of the steel that Markus buys in order to make the framework.

$.....

(Total for Question 10 is 4 marks)

11 A box is put on a horizontal table.

The face of the box in contact with the table is a square of side 1.5 metres.
The pressure on the table due to the box is 34.8 newtons/m^2

Work out the force exerted by the box on the table.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

..... newtons

(Total for Question 11 is 3 marks)

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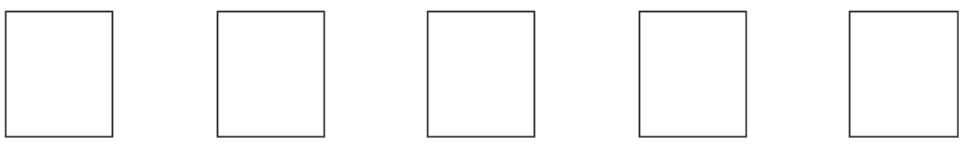
12 Alexa has five cards.
Each card has a number on it.

The table gives information about the numbers on the five cards.

Total	Median	Mode	Range
45	8	5	10

Using the information in the table, complete each card by writing its number on it.



(Total for Question 12 is 3 marks)

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13 In a sale, normal prices are reduced by 30%
The sale price of a T‑shirt was 31.50 euros.

Work out the normal price of the T‑shirt.

..... euros

(Total for Question 13 is 3 marks)

14 Sandeep sat 11 tests in January 2020
Each test was marked out of 60

Here are his test results.

45 41 35 44 38 47 47 39 37 43 42

(*a*) Find the interquartile range of these test results.
Show your working clearly.

.....

(3)

Sandeep also sat some tests in May 2020
Each test was marked out of 60

The median of the May 2020 test results is 42
The interquartile range of the May 2020 test results is 12

(*b*) In which month, January or May, were Sandeep's test results more consistent?
Give a reason for your answer.

.....

.....

(1)

(Total for Question 14 is 4 marks)

15

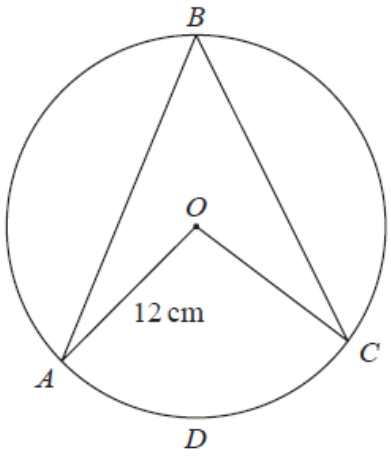

Diagram **NOT** accurately drawn

A, B, C and D are points on a circle with centre O and radius 12 cm.

The area of the sector $OADC$ of the circle is 100 cm^2

Work out the size of angle ABC.
Give your answer correct to 3 significant figures.

.....°

(Total for Question 15 is 4 marks)

16 Point A has coordinates $(-3, 11)$
Point B has coordinates $(47, b)$
The midpoint of AB has coordinates $(a, -19)$

Find the value of a and the value of b.

$a =$ .....

$b =$ .....

(Total for Question 16 is 2 marks)

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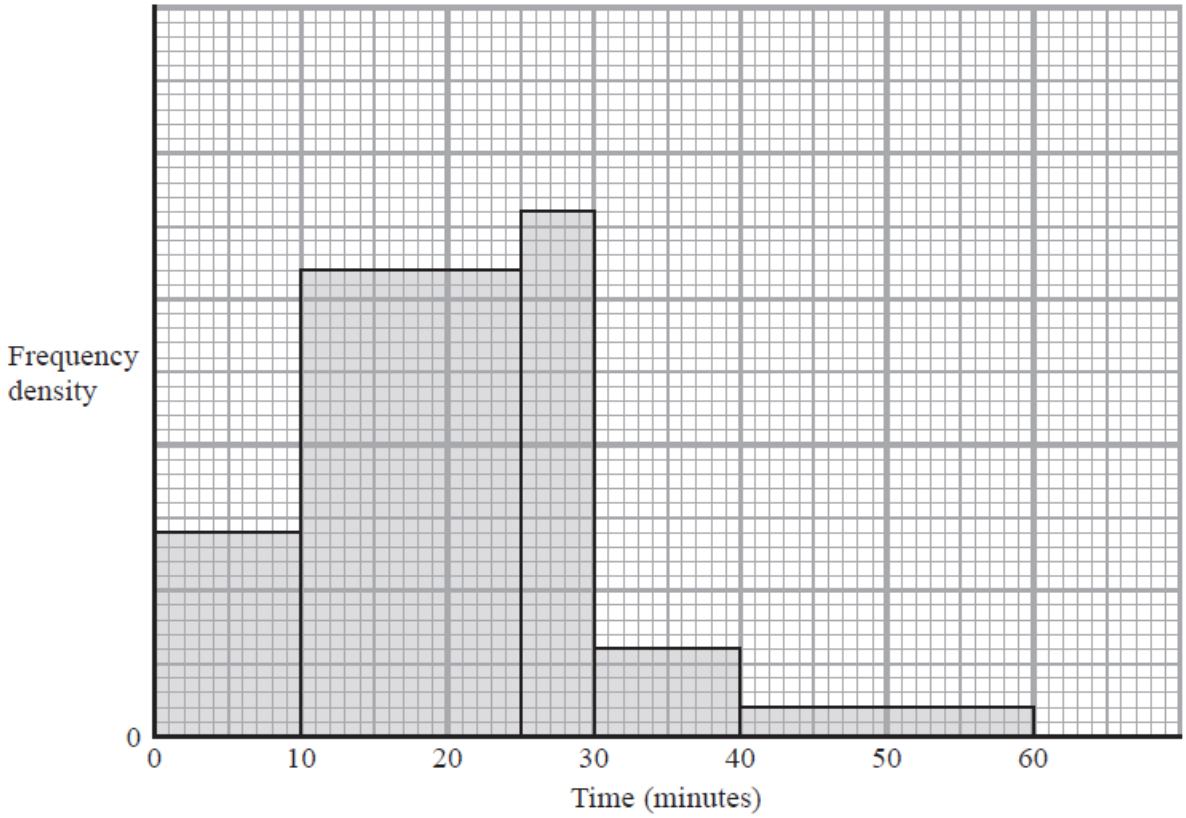
17 The histogram gives information about the times, in minutes, some customers had to wait to be served in a restaurant.



14 customers had to wait less than 10 minutes to be served.

Work out the number of customers who had to wait less than 60 minutes to be served.

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(Total for Question 17 is 3 marks)

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18 The diagram shows a regular octagon *ABCDEFGH*.

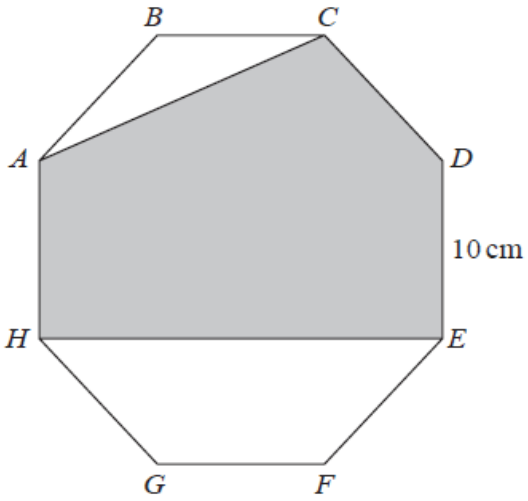

Diagram **NOT** accurately drawn

Each side of the octagon has length 10 cm.

Find the area of the shaded region *ACDEH*.
Give your answer correct to the nearest cm^2

..... cm^2

(Total for Question 18 is 6 marks)

19 The diagram shows rectangle *ABCD* with rectangle *EFGH* cut out to form the shaded region.

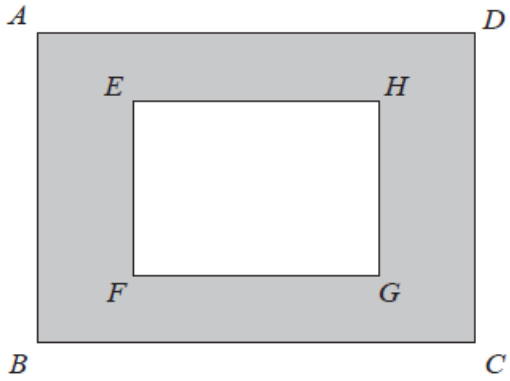

Diagram **NOT** accurately drawn

AD = 8.3 cm correct to one decimal place
DC = 7.2 cm correct to one decimal place
EH = 6.2 cm correct to one decimal place
HG = 5.3 cm correct to one decimal place

Work out the upper bound of the area of the shaded region.
Show your working clearly.

..... cm^2

(Total for Question 19 is 3 marks)

20 P and Q are two points.

The coordinates of P are $(-1, 6)$

The coordinates of Q are $(5, -4)$

Find an equation of the perpendicular bisector of PQ.
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

.....

(Total for Question 20 is 6 marks)

21 In a bag, there are only

3 blue beads
4 white beads
and x orange beads.

Jean is going to take at random two beads from the bag.

The probability that Jean will take two beads of the same colour is $\frac{3}{8}$

Find the total number of beads in the bag.
Show clear algebraic working.

.....

(Total for Question 23 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS