GCSE Mathematics Practice Tests: Set 14

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 The diagram shows a right-angled triangle.

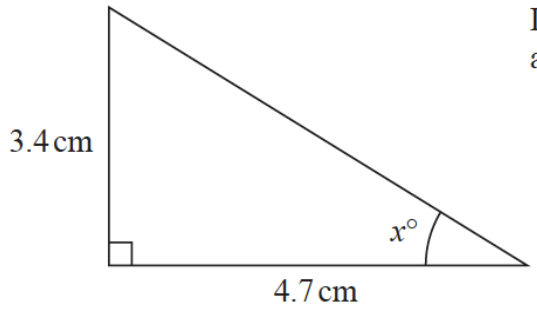

Diagram **NOT** accurately drawn

Calculate the value of x.
Give your answer correct to one decimal place.

x = ...

(Total for Question 1 is 3 marks)

2 Himari's annual salary is 3 130 000 Japanese Yen (JPY).
She gets a salary increase of 4%

(*a*) Work out Himari's salary after this increase.

.....JPY
(3)

Kaito bought a car.

The value of the car when Kaito bought it was 750 000 JPY.
At the end of each year, the value of his car had depreciated by 15%

(*b*) Work out the value of Kaito's car at the end of 3 years.
Give your answer correct to the nearest JPY.

..... JPY
(3)

(Total for Question 2 is 6 marks)

3 The table shows information about the lengths of time, in minutes, 120 customers spent in a supermarket.

Length of time (L minutes)	**Frequency**
$20 < L \leq 30$	6
$30 < L \leq 40$	26
$40 < L \leq 50$	31
$50 < L \leq 60$	40
$60 < L \leq 70$	17

(*a*) Write down the modal class.

.....

(1)

(*b*) Work out an estimate for the mean length of time spent by the 120 customers in the supermarket.

.....minutes

(4)

(Total for Question 3 is 5 marks)

4 In a sale, normal prices are reduced by 20%
A designer handbag costs £1080 in the sale.

Work out the normal price of the bag.

£.....

(Total for Question 4 is 3 marks)

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5 The diagram shows an isosceles triangle.

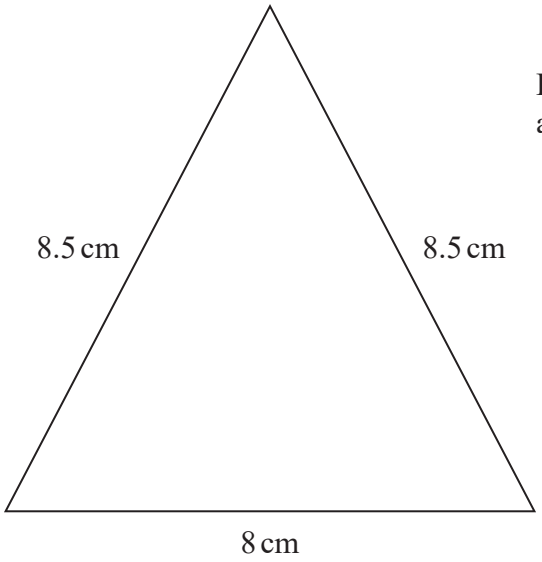


Diagram **NOT** accurately drawn

Work out the area of the triangle.

.....cm^2

(Total for Question 5 is 4 marks)

6 Here is a list of six numbers written in order of size.

4 7 x 10 y y

The numbers have

a median of 9
a mean of 11

Find the value of x and the value of y.

x = ...

y = ...

(Total for Question 6 is 4 marks)

7 The diagram shows a solid cylinder with radius 3 m.

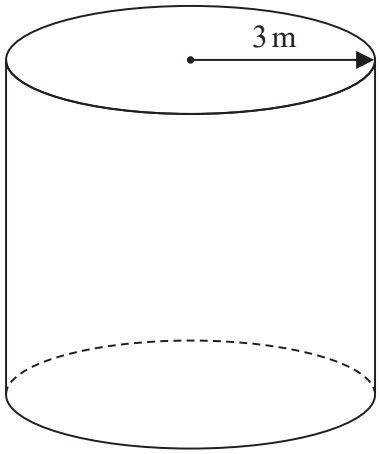


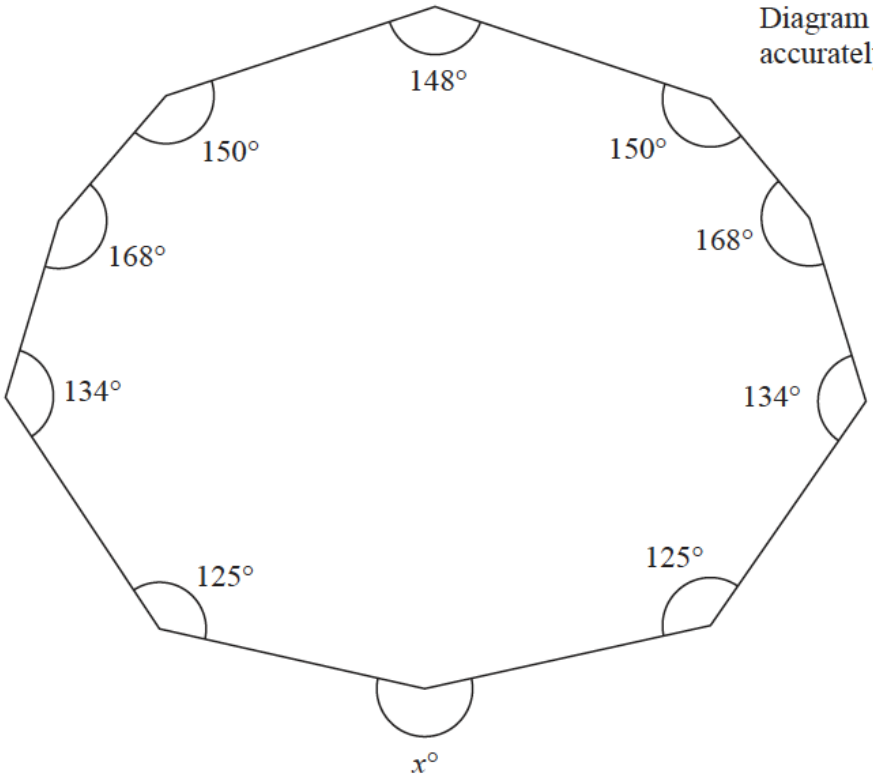
Diagram **NOT** accurately drawn

The volume of the cylinder is 72π m^3
Calculate the **total** surface area of the cylinder.
Give your answer correct to 3 significant figures.

.....m^2

(Total for Question 7 is 5 marks)

8 Here is a 10-sided polygon.



Work out the value of x.

x = ...

(Total for Question 8 is 4 marks)

9 A rocket travelled 100 km at an average speed of 28 440 km/h.

Work out how long it took the rocket to travel the 100 km.
Give your answer in seconds, correct to the nearest second.

..... seconds

(Total for Question 9 is 3 marks)

---

10 Toy cars are made in a factory.

The toy cars are made for 15 hours each day.
5 toy cars are made every 12 seconds.

For the toy cars made each day, the probability of a toy car being faulty is 0.002

Work out an estimate of the number of faulty toy cars that are made each day.

.....

(Total for Question 10 is 4 marks)

11

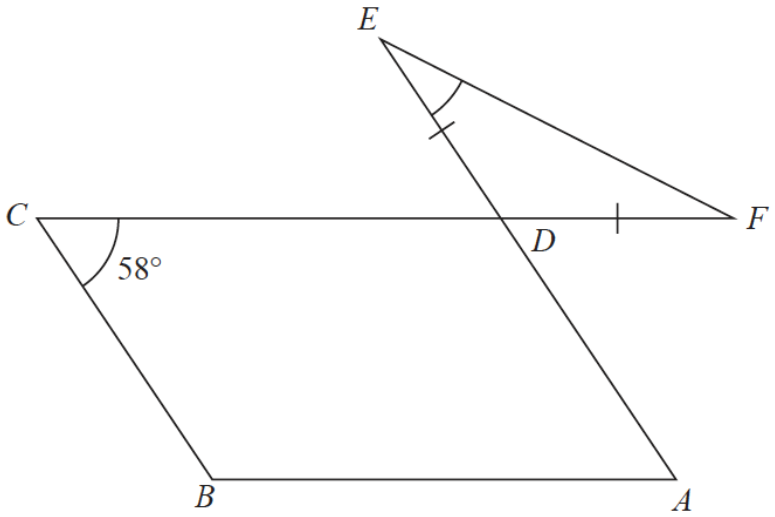


Diagram **NOT** accurately drawn

The diagram shows a parallelogram *ABCD* and an isosceles triangle *DEF* in which *DE* = *DF*

CDF and *ADE* are straight lines.
Angle *BCD* = 58°

Work out the size of angle *DEF*.
Give a reason for each stage of your working.

.....°

(Total for Question 11 is 5 marks)

12 The diagram shows trapezium $ABCD$ in which BC and AD are parallel.

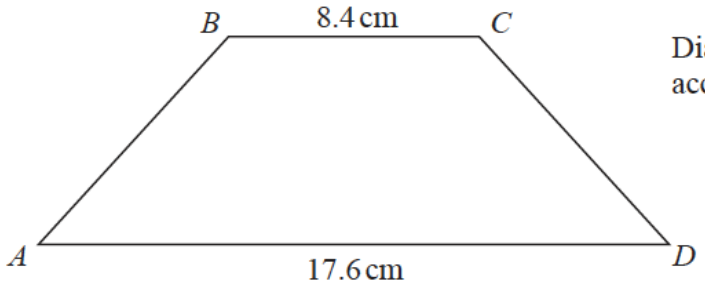


Diagram **NOT** accurately drawn

The trapezium has exactly one line of symmetry.

$BC = 8.4$ cm
$AD = 17.6$ cm

The trapezium has area 179.4 cm^2

Work out the size of angle ABC.
Give your answer correct to 1 decimal place.

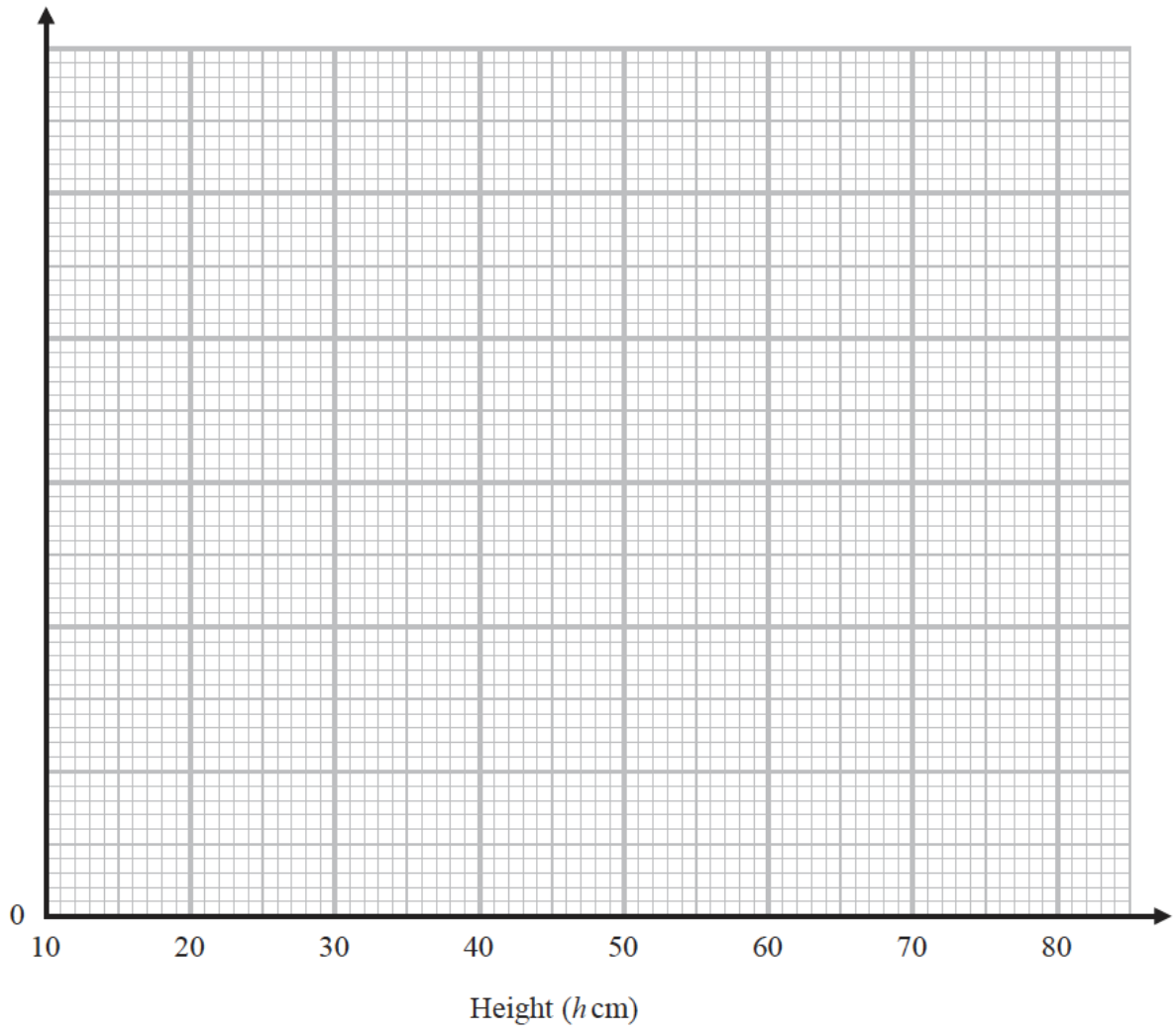
.....°

(Total for Question 12 is 6 marks)

13 The table gives information about the heights, in centimetres, of some plants.

Height (h cm)	Frequency
$10 < h \leq 20$	35
$20 < h \leq 35$	45
$35 < h \leq 50$	75
$50 < h \leq 70$	40
$70 < h \leq 80$	8

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



(3)

(*b*) Work out an estimate for the number of these plants with a height greater than 40 cm.

.....

(2)

(Total for Question 13 is 5 marks)

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14 Jan invests $8000 in a savings account.

The account pays compound interest at a rate of x % per year.
At the end of 6 years, there is a total of $8877.62 in the account.

Work out the value of x.
Give your answer correct to 2 decimal places.

x = ...

(Total for Question 14 is 3 marks)

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15 The diagram shows cuboid *ABCDEFGH*.

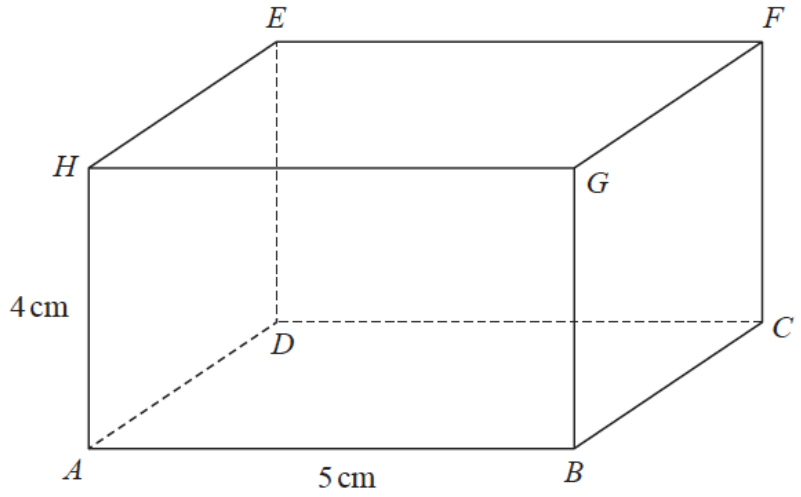

Diagram **NOT** accurately drawn

AB = 5 cm
AH = 4 cm
The size of the angle between *CH* and the plane *ABCD* is 35°
Calculate the volume of the cuboid.
Give your answer correct to 3 significant figures.

.....cm^3

(Total for Question 15 is 5 marks)

16 Andreas, Isla and Paulo share some money in the ratios 3 : 2 : 5

The **total** amount of money that Isla and Paulo receive is £76 more than the amount of money that Andreas receives.

Andreas buys a video game for £48.50 with some of his share of the money.

Work out how much money Andreas has left from his share of the money when he has bought the video game.

£.....

(Total for Question 16 is 4 marks)

17 **R** and **S** are two similar solid shapes.

Shape **R** has surface area 108 cm^2 and volume 135 cm^3
Shape **S** has surface area 300 cm^2

Work out the volume of shape **S**.

..... cm^3

(Total for Question 17 is 3 marks)

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18 $A = 2 \times 3^{43}$

$B = 16 \times 3^{37}$

(*a*) Find the highest common factor (HCF) of A and B.

.....

(1)

(*b*) Express the number $A \times B$ as a product of powers of its prime factors.
Give your answer in its simplest form.

.....

(2)

(Total for Question 18 is 3 marks)

19 $ABCD$ is a rhombus.

The diagonals, AC and BD, intersect at the point M. The coordinates of M are $(6, -11)$

The points A and C both lie on the line with equation $2y + 7x = 20$

Find the exact coordinates of the point where the line through B and D intersects the y-axis.

(..... , ...)

(Total for Question 19 is 4 marks)

20 A metal block has a mass of 5 kg, correct to the nearest 50 grams.
The block has a volume of (1.84×10^{-3}) m^3, correct to 3 significant figures.

Work out the upper bound for the density of the block.

Give your answer in kg/m^3 correct to 1 decimal place.
Show your working clearly.

..... kg/m^3

(Total for Question 20 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS