GCSE Mathematics Practice Tests: Set 19

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
- 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

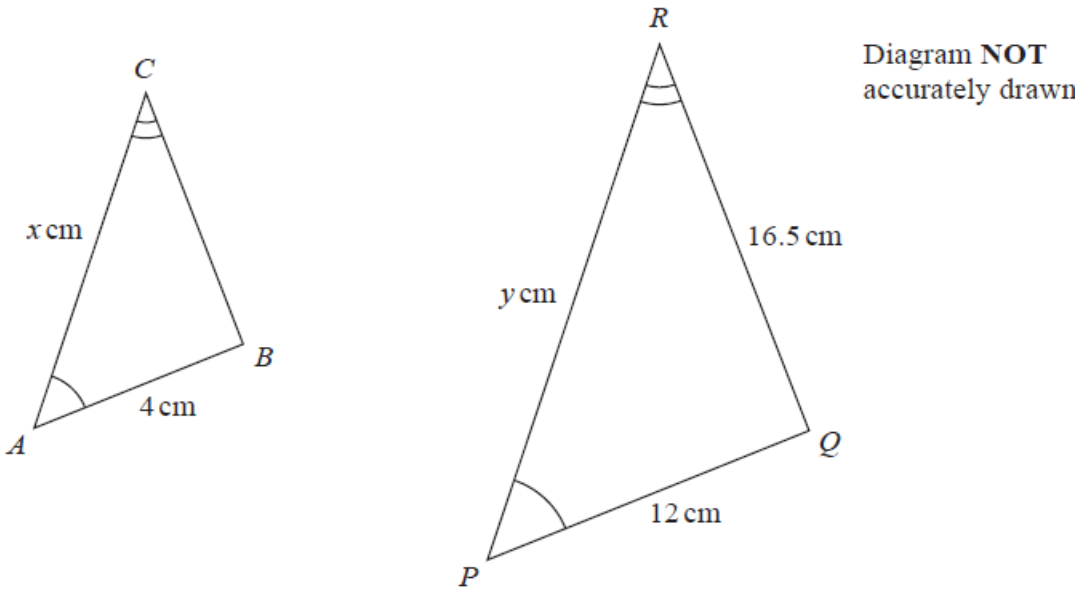
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL TWENTY questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1



Triangle ABC is similar to triangle PQR

$AB = 4$ cm $PQ = 12$ cm $RQ = 16.5$ cm $AC = x$ cm $PR = y$ cm

(a) Calculate the length of BC

..... cm

(2)

(b) Write down an expression for y in terms of x

$y =$ .....

(1)

(Total for Question 1 is 3 marks)

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2 The diagram shows triangle ABC

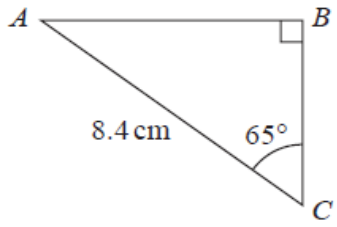


Diagram **NOT** accurately drawn

Work out the length of the side AB
Give your answer correct to 3 significant figures.

..... cm

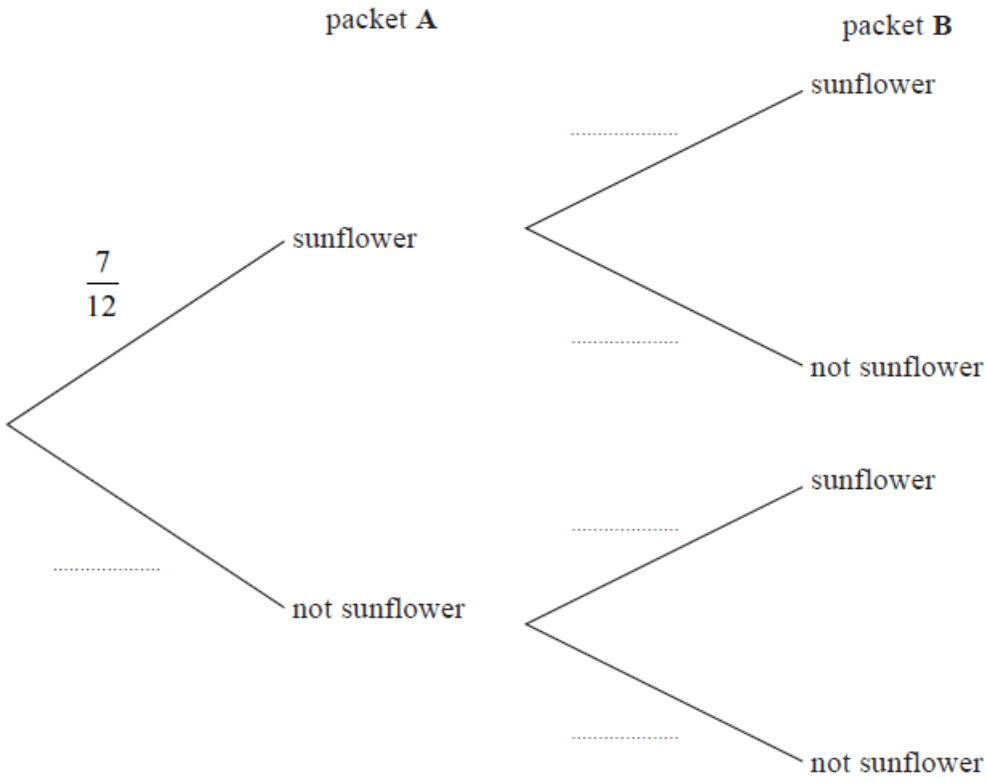
(Total for Question 2 is 3 marks)

3 Aika has 2 packets of seeds, packet **A** and packet **B**

There are 12 seeds in packet **A** and 7 of these are sunflower seeds.
There are 15 seeds in packet **B** and 8 of these are sunflower seeds.

Aika is going to take at random a seed from packet **A** and a seed from packet **B**

(*a*) Complete the probability tree diagram.



(2)

(*b*) Calculate the probability that Aika will take two sunflower seeds.

.....

(2)

(Total for Question 3 is 4 marks)

4 Sarah makes and sells mugs.

One day she makes 150 mugs.
Her total cost for making these mugs is £1140

Of these mugs

$\frac{2}{5}$ are small mugs

32% are medium mugs

and the rest are large mugs

Here is Sarah's price list for selling each mug.

MUGS	
Small	**£8.50**
Medium	**£11.20**
Large	**£14.20**

Sarah sells all 150 mugs.

Work out her percentage profit.
Give your answer correct to the nearest whole number.

.....%

(Total for Question 4 is 5 marks)

5 Find the lowest common multiple (LCM) of 28, 42 and 63
Show your working clearly.

.....

(Total for Question 5 is 3 marks)

TURN OVER FOR QUESTION 6

6 The table gives information about the times, in minutes, taken by 80 customers to do their shopping in a supermarket.

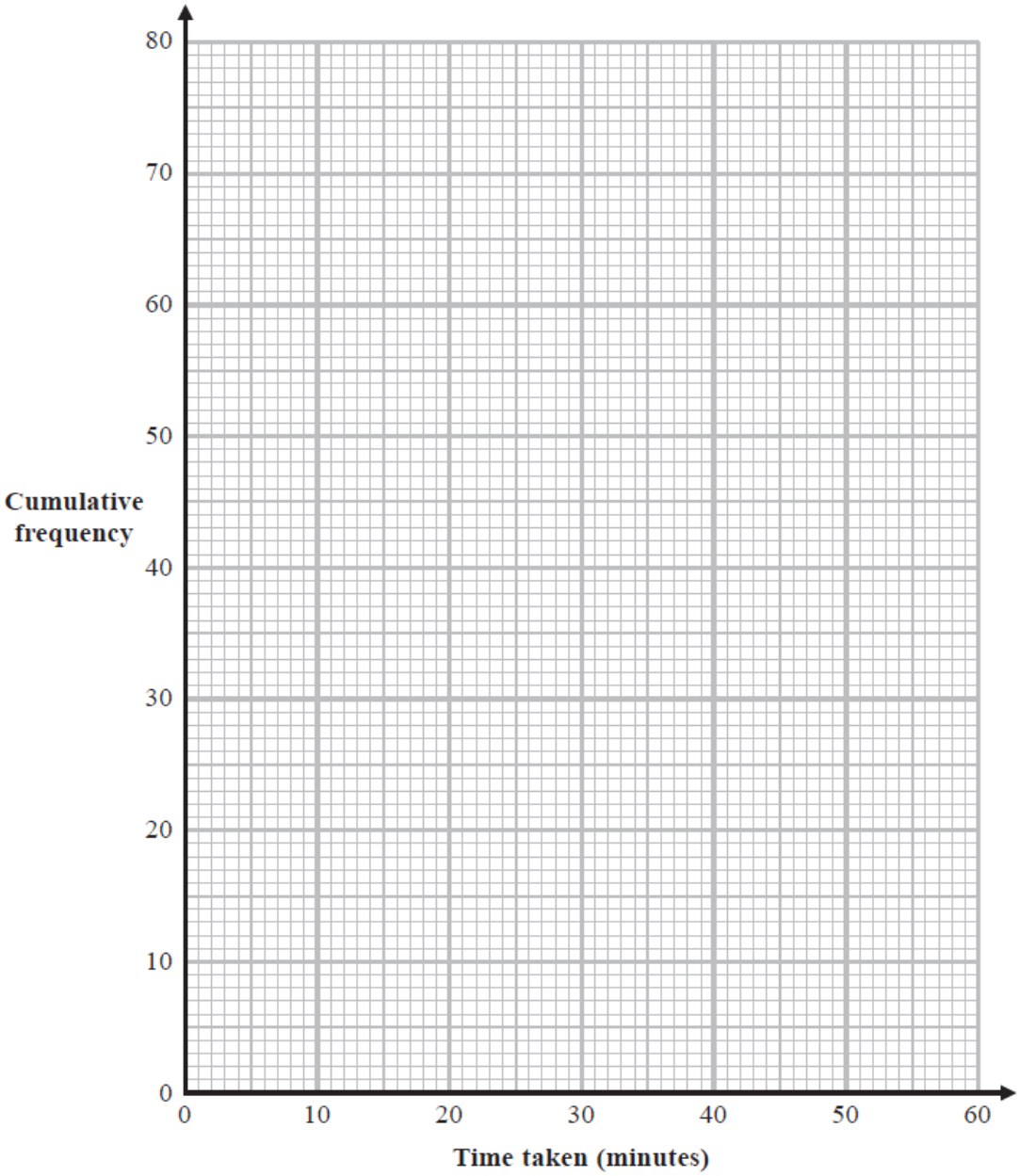
Time taken (t minutes)	Frequency
$0 < t \leq 10$	7
$10 < t \leq 20$	26
$20 < t \leq 30$	24
$30 < t \leq 40$	14
$40 < t \leq 50$	7
$50 < t \leq 60$	2

(*a*) Complete the cumulative frequency table.

Time taken (t minutes)	Cumulative frequency
$0 < t \leq 10$	
$10 < t \leq 20$	
$20 < t \leq 30$	
$30 < t \leq 40$	
$40 < t \leq 50$	
$50 < t \leq 60$	

(1)

(*b*) On the grid on the next page, draw a cumulative frequency graph for your table.



(2)

(*c*) Use your graph to find an estimate for the median time taken.

..... minutes

(1)

One of the 80 customers is chosen at random.

(*d*) Use your graph to find an estimate for the probability that the time taken by this customer was more than 42 minutes.

.....

(2)

(Total for Question 6 is 6 marks)

7 A bag contains only pink sweets, white sweets, green sweets and red sweets.
The table gives each of the probabilities that, when a sweet is taken at random from the bag, the sweet will be green or the sweet will be red.

Sweet	pink	white	green	red
Probability			0.2	0.35

The ratio

number of pink sweets : number of white sweets = 2 : 1

There are 28 red sweets in the bag.

Work out the number of white sweets in the bag.

.....

(Total for Question 7 is 5 marks)

8 Danil, Gabriel and Hadley share some money in the ratios 3 : 5 : 9

The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

..... euros

(Total for Question 8 is 3 marks)

9 Jenny has six cards.

Each card has a whole number written on it so that

the smallest number is 5
the largest number is 24
the median of the six numbers is 14
the mode of the six numbers is 8

Jenny arranges her cards so that the numbers are in order of size.

(*a*) For the remaining four cards, write on each dotted line a number that could be on the card.

(3)

A basketball team plays 6 games.
After playing 5 games, the team has a mean score of 21 points per game.
After playing 6 games, the team has a mean score of 23 points per game.

(*b*) Work out the number of points the team scored in its 6th game.

.....

(3)

(Total for Question 9 is 6 marks)

10 The table gives information about the average house price in England in 2018 and in 2019

Year	**2017**	**2018**	**2019**
Average house price (£)		228 314	231 776

(*a*) Work out the percentage increase in the average house price from 2018 to 2019
Give your answer correct to one decimal place.

..... %

(2)

The average house price in 2019 was 7.7% greater than the average house price in 2017

(*b*) Work out the average house price in 2017
Give your answer correct to 3 significant figures.

£ .....

(3)

(Total for Question 10 is 5 marks)

11 The frequency table gives information about the number of points scored by a player.

Number of points	Frequency
0	13
1	17
2	8
3	x
4	11

The mean number of points scored is 2

Work out the value of x

$x =$ .....

(Total for Question 11 is 4 marks)

12 Himari invests 200 000 yen for 3 years in a savings account paying compound interest.
The rate of interest is 1.8% for the first year and x% for each of the second year and the third year.

The value of the investment at the end of the third year is 209 754 yen.

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

x = ...

(Total for Question 12 is 3 marks)

13 A is inversely proportional to C^2

$A = 40$ when $C = 1.5$

Calculate the value of C when $A = 1000$

$C =$ .....

(Total for Question 13 is 3 marks)

14 $A = w - \dfrac{x^2}{y}$

w = 3.45 correct to 2 decimal places.
x = 1.9 correct to 1 decimal place.
y = 5 correct to the nearest whole number.

Work out the lower bound of the value of A
Show your working clearly.

.....

(Total for Question 14 is 3 marks)

15 The diagram shows a circle with centre O

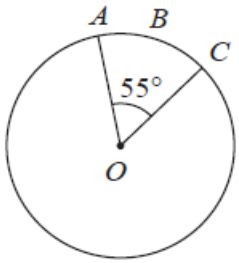


Diagram **NOT** accurately drawn

A, B and C are points on the circle so that the length of the arc ABC is 5 cm.

Given that angle $AOC = 55°$

work out the area of the circle.
Give your answer correct to one decimal place.

..... cm^2

(Total for Question 15 is 4 marks)

16 A zip wire is shown as the dashed line AC in the diagram.

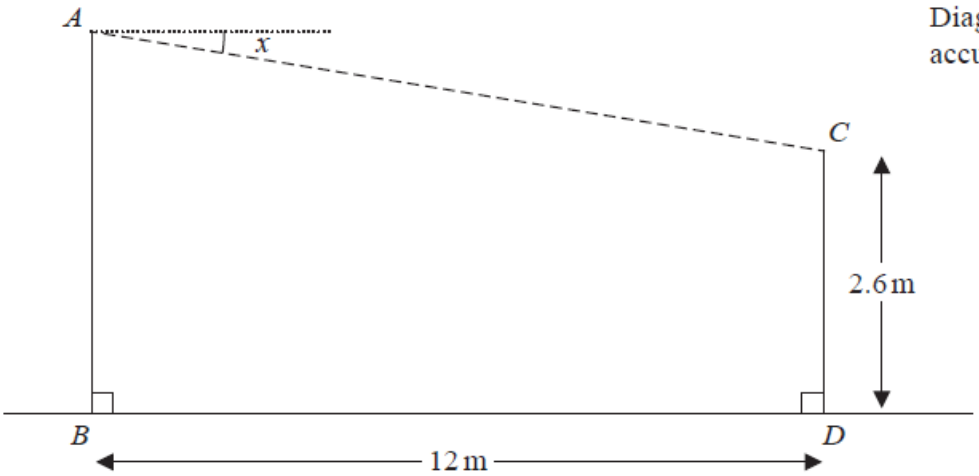


Diagram **NOT** accurately drawn

The zip wire is supported by two vertical posts AB and CD standing on horizontal ground.

$CD = 2.6$ m $\qquad$ $BD = 12$ m

The zip wire makes an angle x with the horizontal, as shown in the diagram.
The design of the zip wire requires the angle x to be at least 5°

Work out the least possible height of the post AB
Give your answer correct to 3 significant figures.

..... m

(Total for Question 16 is 3 marks)

17 Here is a rectangle.

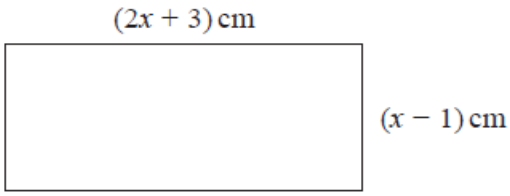


Diagram **NOT** accurately drawn

Given that the area of the rectangle is less than 75 cm^2

find the range of possible values of x

.....

(Total for Question 17 is 5 marks)

18 D, E, F and G are points on a circle, centre O

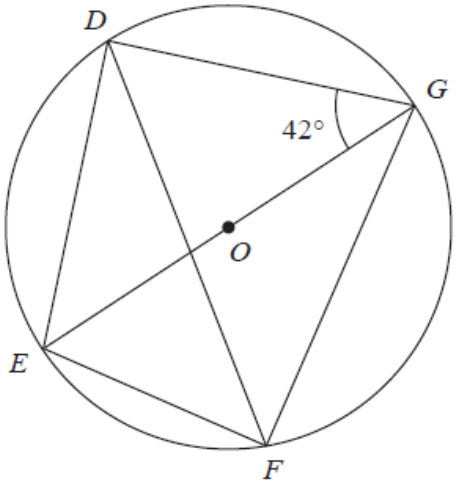


Diagram **NOT** accurately drawn

EOG is a diameter of the circle.

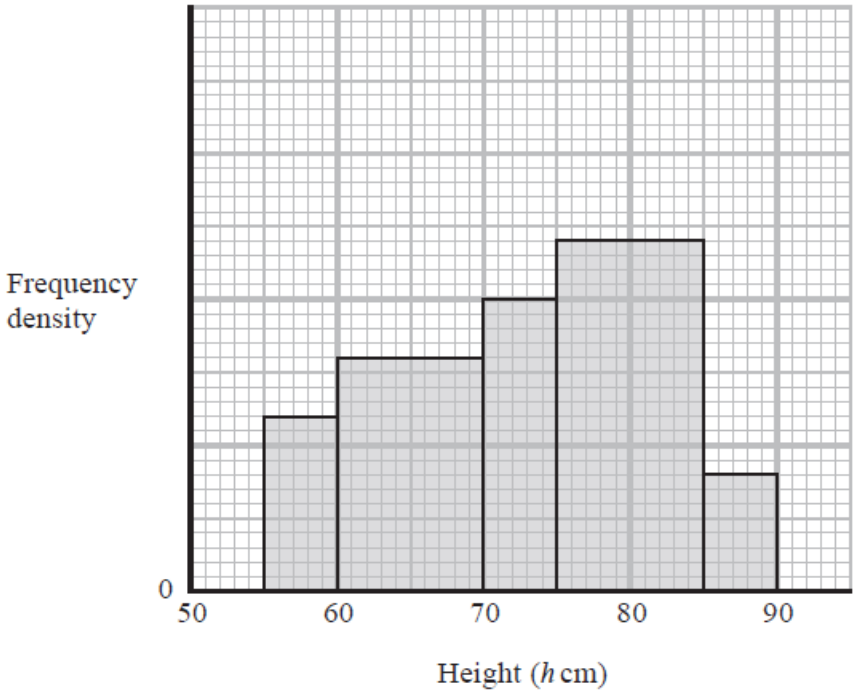
Angle $EGD = 42°$

Calculate the size of angle DFG
Give a reason for each stage of your working.

Angle DFG = ... °

(Total for Question 18 is 4 marks)

19 The histogram gives information about the heights, h cm, of some tomato plants.



There are 12 tomato plants for which $75 < h \leq 85$

One of the tomato plants is selected at random.

Find an estimate for the probability that this tomato plant has a height greater than 82.5 cm

.....

(Total for Question 19 is 4 marks)

20 **A** and **B** are two similar vases.

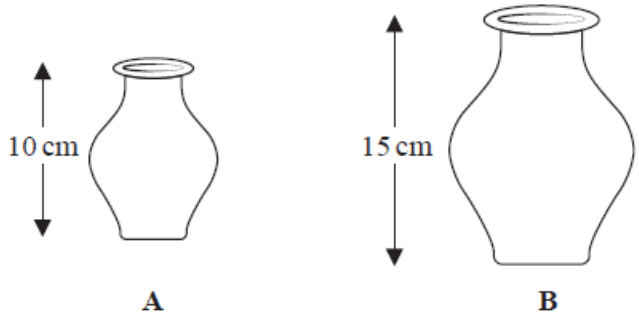


Diagram **NOT** accurately drawn

Vase **A** has height 10 cm.
Vase **B** has height 15 cm.

The difference between the volume of vase **A** and the volume of vase **B** is 1197 cm^3

Calculate the volume of vase **A**

..... cm^3

(Total for Question 20 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

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