GCSE Mathematics

Practice Tests: Set 9

Paper 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
- 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 (*a*) Work out the value of $\left(\frac{125.6}{4.7}\right)^2$

Write down all the figures on your calculator display.

.....

(2)

(*b*) Write your answer to part (*a*) correct to 3 significant figures.

.....

(1)

(Total for Question 1 is 3 marks)

---

2 Helga has played a game many times.

She scored 9 or more in $\frac{5}{6}$ of these games.

Helga is going to play the game another 60 times.

Work out an estimate for the number of times she will score 9 or more in these 60 games.

.....

(Total for Question 2 is 2 marks)

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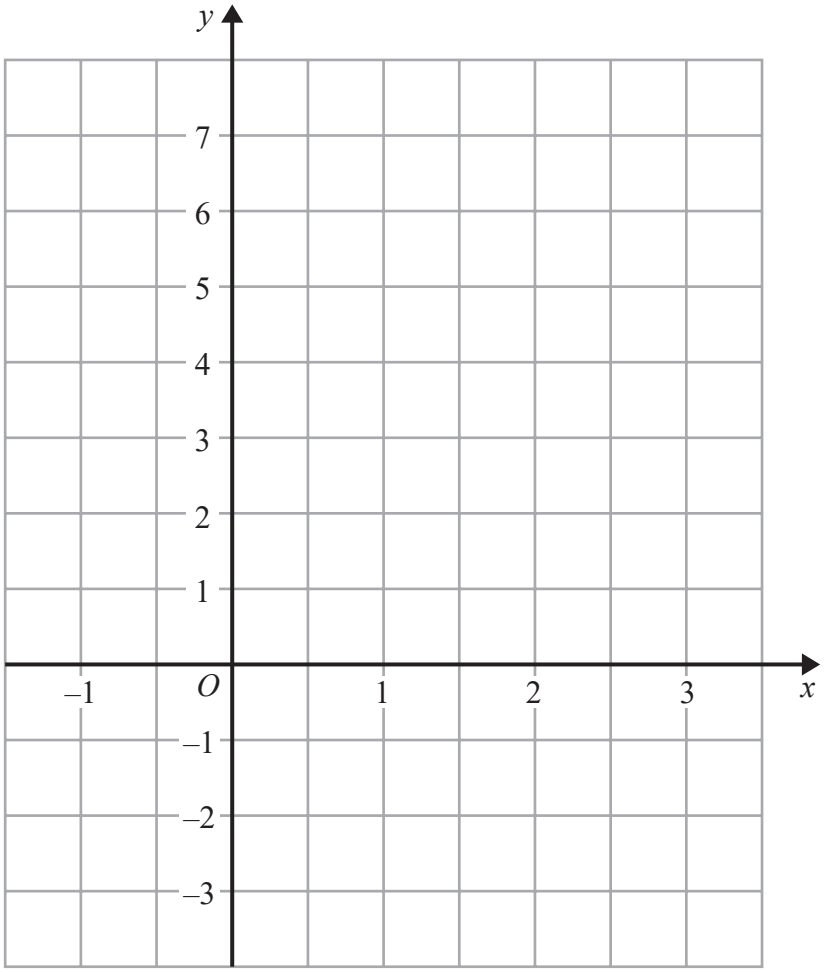
3 (*a*) On the grid, draw the graph of $y = 4 - 2x$ for values of x from –1 to 3.



(3)

(*b*) Write down the coordinates of the point where the graph of $y = 4 - 2x$ crosses the line $y = 1$

(..... , ...)

(1)

(Total for Question 3 is 4 marks)

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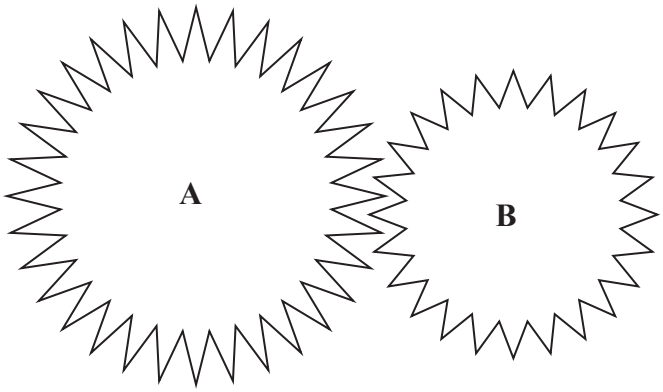
4 The diagram shows two cogs, **A** and **B**.



There are 32 teeth on cog **A**.
There are 24 teeth on cog **B**.

The two cogs both rotate.
Cog **A** completes 12 full turns while cog **B** completes 16 full turns.

Work out the number of full turns that cog **A** completes while cog **B** completes 60 full turns.

.....

(**Total for Question 4 is 2 marks**)

5 The size of each exterior angle of a regular polygon is 24°

(*a*) Work out the number of sides of the polygon.

.....

(2)

Here is a pentagon.

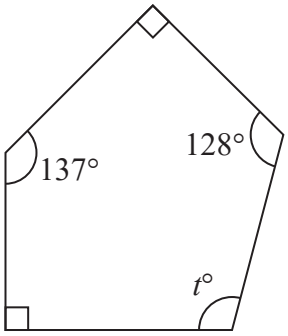


Diagram **NOT** accurately drawn

(*b*) Work out the value of *t*.

.....

(3)

(Total for Question 5 is 5 marks)

6 Marta breeds dogs.
32 dogs give birth to puppies.
The table shows information about the number of puppies born to each dog.

Number of puppies	Frequency
1 − 3	5
4 − 6	12
7 − 9	10
10 − 12	4
13 − 15	1

(*a*) Write down the modal class.

.....

(**1**)

(*b*) Work out an estimate for the mean number of puppies born to each dog.

.....

(**4**)

(**Total for Question 6 is 5 marks**)

7

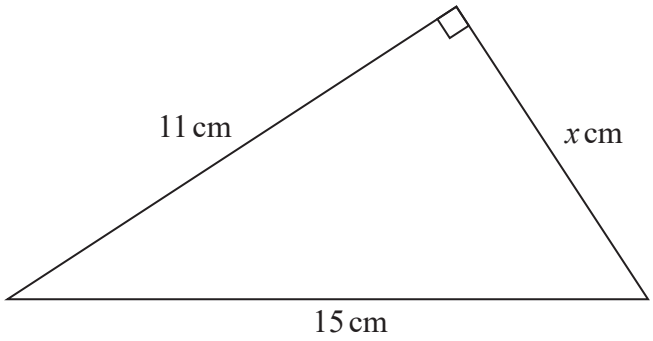


Diagram **NOT** accurately drawn

Work out the value of x.
Give your answer correct to 3 significant figures.

.....

(**Total for Question 7 is 3 marks**)

8 The line **L** has equation $4x + 5y = 20$

(*a*) Work out the gradient of **L**.

.....

(2)

The line **M** has gradient 2.
L and **M** both cross the *y*-axis at the same point.

(*b*) Find an equation for **M**.

.....

(2)

(Total for Question 8 is 4 marks)

9

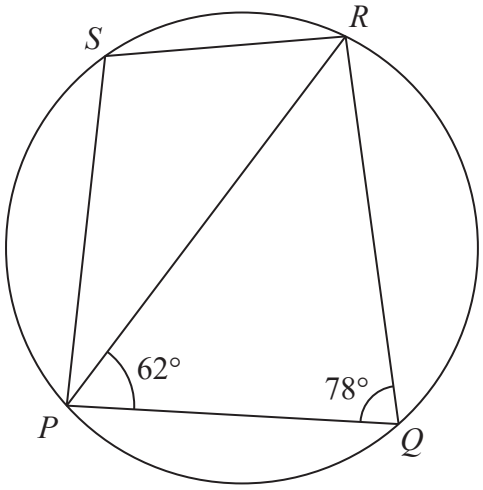


Diagram **NOT** accurately drawn

P, *Q*, *R* and *S* are points on a circle.
Angle *RPQ* = 62° and angle *PQR* = 78°

(*a*) (i) Find the size of angle *PSR*.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

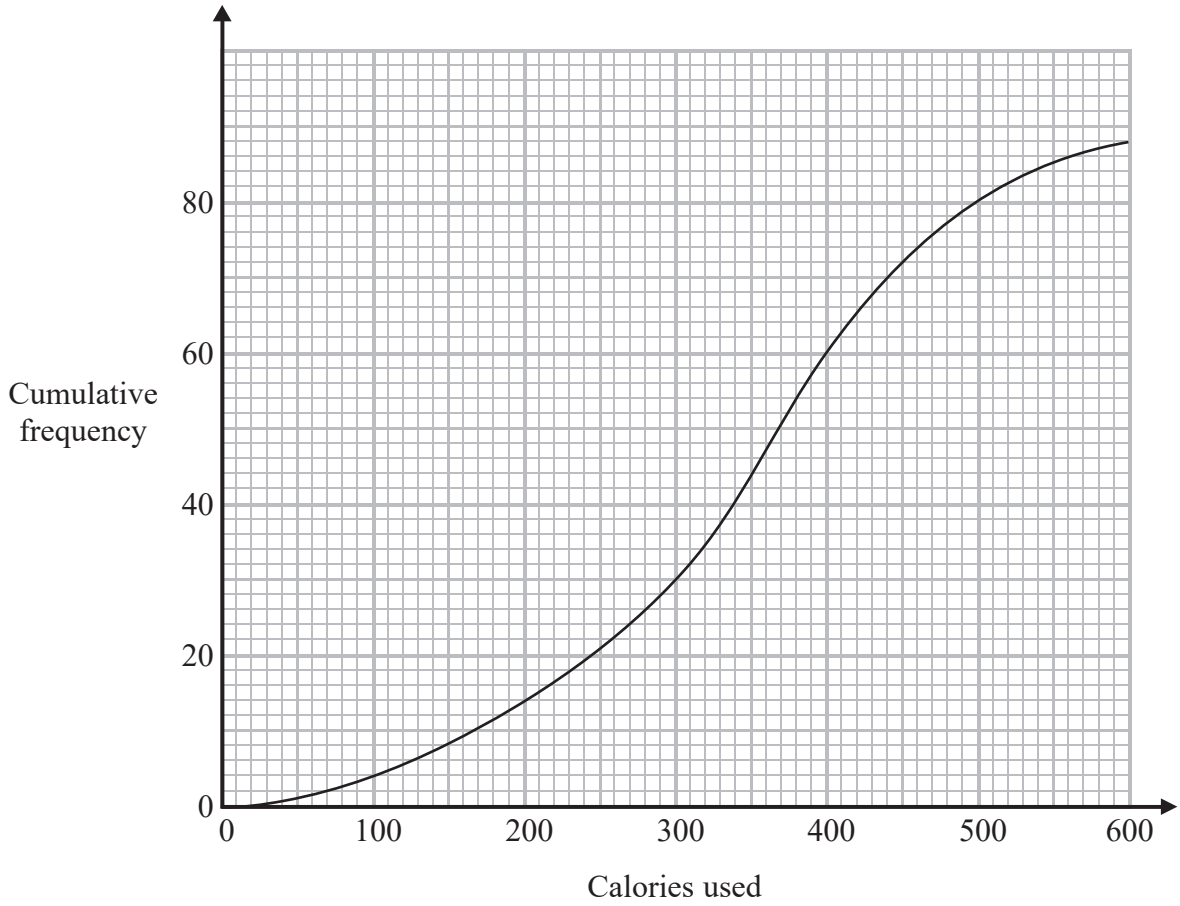
(*b*) Work out the size of angle *PSQ*.

..... °

(2)

(Total for Question 9 is 4 marks)

10 The cumulative frequency graph shows information about the number of calories used by 88 people during their exercise programme at a sports centre.



(*a*) Use the graph to find an estimate for the median number of calories used.

..... calories

(2)

(*b*) Use the graph to find an estimate for the number of these 88 people who used more than 500 calories.

.....

(2)

(Total for Question 10 is 4 marks)

11 (*a*) Solve the inequality $\frac{1}{4}p < 7$

.....

(1)

(*b*) Solve the inequality $16q^2 > 9$

.....

(3)

(Total for Question 11 is 4 marks)

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12 Cylinder **A** has height 12 cm and diameter 8 cm.

(*a*) Work out the volume of cylinder **A**.
Give your answer correct to 3 significant figures.

..... cm^3
(**2**)

Cylinder **B** is similar to cylinder **A**.
The height of cylinder **B** is 21 cm.

(*b*) Work out the diameter of cylinder **B**.

..... cm
(**2**)

Cylinder **C** is similar to cylinder **A**.
The volume of cylinder **C** is 64 times the volume of cylinder **A**.

(*c*) Work out the height of cylinder **C**.

..... cm
(**3**)

(**Total for Question 12 is 7 marks**)

13 Daniel buys a new car.
In the first year, the value of the car decreases by 24% of its original value.
The value of the car at the end of the first year is £13 300.

(*a*) Work out the original value of the car.

£ .....

(3)

The value of the car at the end of the first year is £13 300.

In each of the second year, the third year and the fourth year, the value of the car decreases by x% of its value at the beginning of each year.

The value of the car at the end of the fourth year is £6500.

(*b*) Work out the value of x.
Give your answer correct to 3 significant figures.

x = ...

(3)

(Total for Question 13 is 6 marks)

14 Two fair 6-sided dice are thrown.
The total is the sum of the numbers that each dice lands on.

(*a*) Work out the probability that the total is 4.

.....

(**2**)

Three people each throw the two dice.

(*b*) Work out the probability that none of the three people get a total of 4.

.....

(**2**)

(**Total for Question 14 is 4 marks**)

15 Here is a quadrilateral *PQRS*.

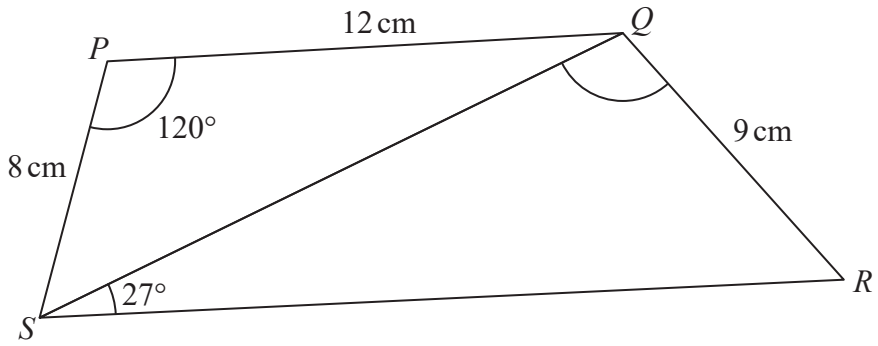

Diagram **NOT** accurately drawn

Angle *SRQ* is acute.

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

..... °

(Total for Question 15 is 6 marks)

16 Solve the simultaneous equations

$$y = 5x^2$$
$$y - 4 = 3x$$

Show your working clearly.
Give your solutions correct to 2 decimal places.

.....

(**Total for Question 16 is 4 marks**)

17 Show that $\dfrac{\sqrt{50}-\sqrt{18}}{4}$ can be written in the form $\dfrac{1}{\sqrt{k}}$ where k is an integer.

Show your working clearly.

(Total for Question 17 is 3 marks)

18

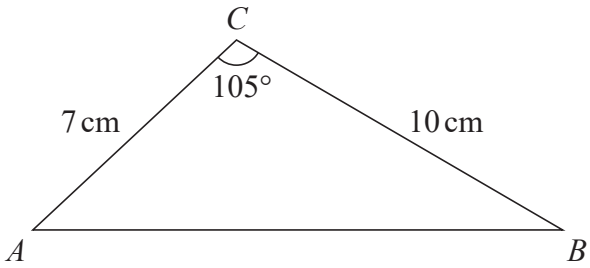

Diagram **NOT** accurately drawn

(*a*) Work out the area of triangle *ABC*.
Give your answer correct to 3 significant figures.

..... cm^2
(2)

(*b*) Work out the size of angle *BAC*.
Give your answer correct to 1 decimal place.

..... °

(5)

(Total for Question 18 is 7 marks)

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19 Simplify fully $\dfrac{12x^2 - 3}{6x^2 + 5x - 4}$

.....

(Total for Question 19 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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