

# GCSE Mathematics

## Practice Tests: Set 6

### Paper 1H (Non-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

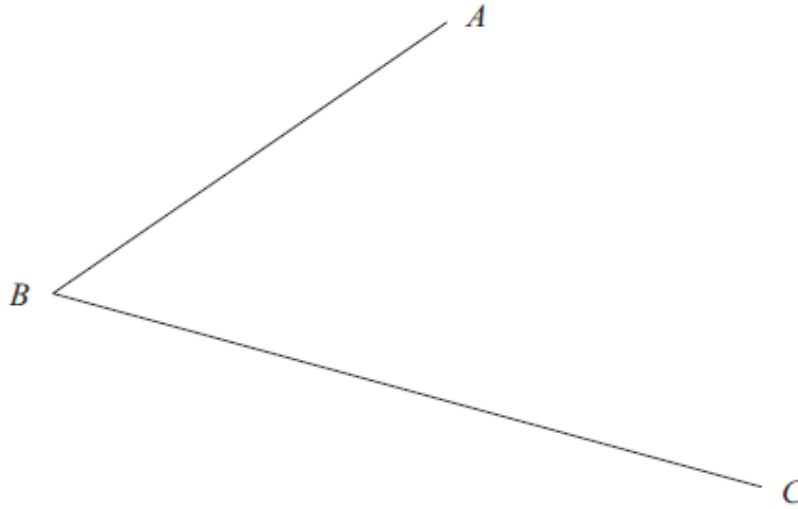
- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question*.

#### 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. Use ruler and compasses to construct the bisector of angle  $ABC$ .  
You must show all your construction lines.



**(Total 2 marks)**

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2. Peter, Tarish and Ben share £54.  
  
Tarish gets three times as much money as Peter.  
Ben gets twice as much money as Tarish.

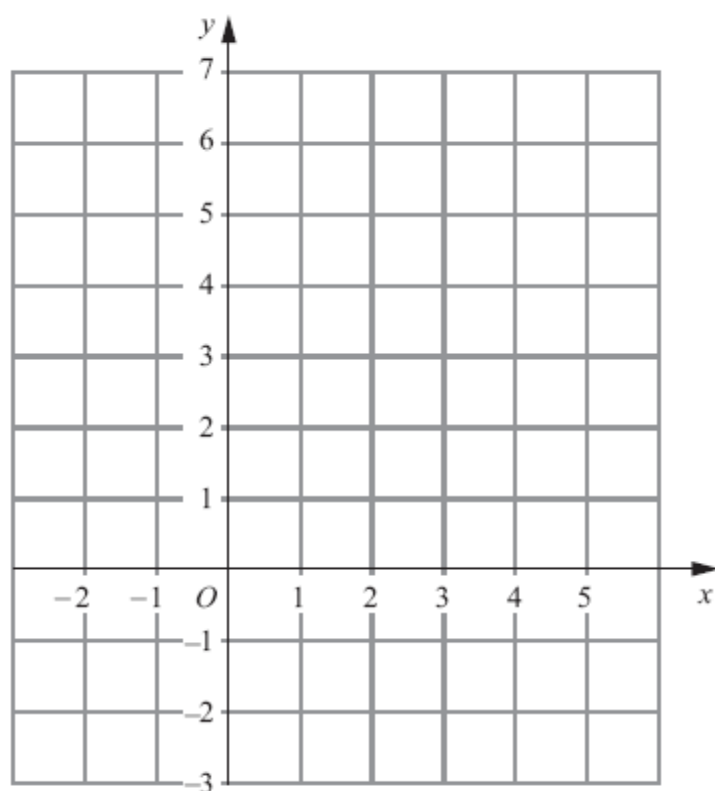
How much money does Ben get?

£ .....

**(Total 3 marks)**

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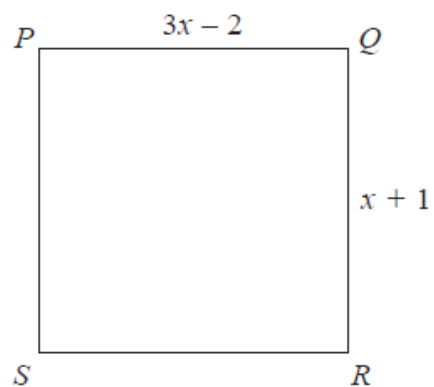
3. On the grid draw the graph of  $x + y = 4$  for values of  $x$  from  $-2$  to  $5$



**(Total 3 marks)**

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4.  $PQRS$  is a square.



All measurements are in centimetres.

Show that the perimeter of the square is 10 cm.

**(Total 4 marks)**

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5. The diagram shows the plan of a floor.

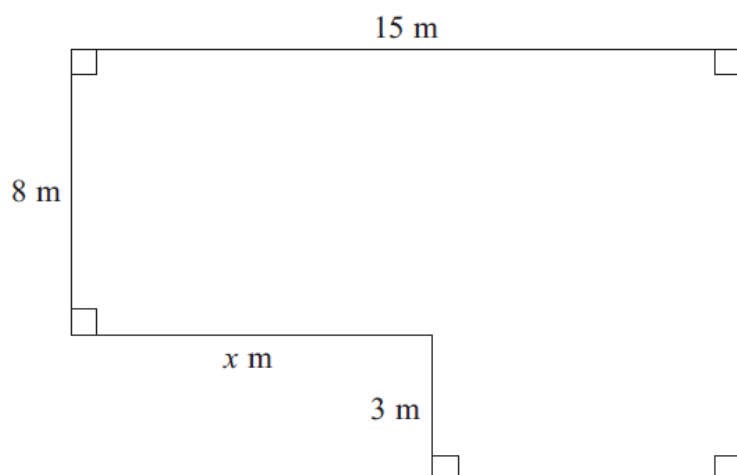


Diagram **NOT**  
accurately drawn

The area of the floor is  $138 \text{ m}^2$ .

Work out the value of  $x$ .

**(Total 4 marks)**

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6. There are 40 litres of water in a barrel.

The water flows out of the barrel at a rate of 125 millilitres per second.

1 litre = 1000 millilitres.

Work out the time it takes for the barrel to empty completely.

..... seconds

**(Total 3 marks)**

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7. (a) Work out  $\frac{2}{5} + \frac{1}{4}$

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

- (b) Work out  $3\frac{1}{8} \times \frac{2}{5}$

Give your answer as a fraction in its simplest form.

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

**(Total 5 marks)**

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8. Lillian, Max and Nazia share a sum of money in the ratio 2 : 3 : 5

(a) What fraction of the money does Max receive?

.....  
(2)

Nazia receives £60

(b) Work out how much money Lillian receives.

£ .....  
(3)

(Total 5 marks)

9. (a) Solve  $11 - 4y = 6y - 3$

$$y = \dots\dots\dots (2)$$

- (b) Solve  $x^2 - 3x - 40 = 0$

$$x = \dots\dots\dots, x = \dots\dots\dots (3)$$

**(Total 5 marks)**

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10. There are 11 pens in a box.

6 of the pens are black.  
3 of the pens are red.  
2 of the pens are green.

Henry takes at random two pens from the box.

Work out the probability that he takes one black pen and one green pen.

.....  
**(Total 4 marks)**

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11. The size of the obtuse angle in an isosceles triangle is  $x^\circ$ .

Write an expression, in terms of  $x$ , for the size, in degrees, of one of the other two angles.

.....  
(Total 2 marks)

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12. (a) Write down the value of  $9^{\frac{1}{2}}$

.....  
(1)

- (b) Write down the value of  $8^{-\frac{1}{3}}$

.....  
(1)

$$2^k = 16$$

- (c) Write down the value of  $k$ .

.....  
(1)

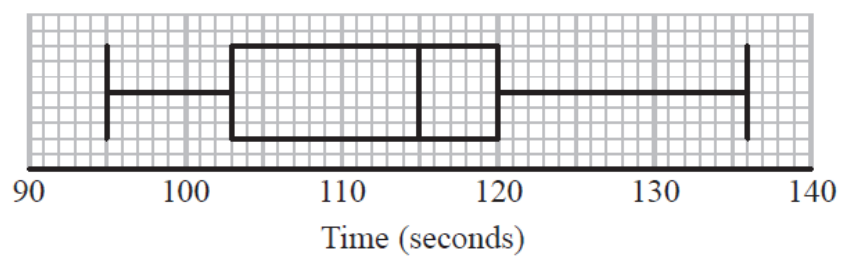
- (d) Solve  $8^5 = 2^{2m+3}$

.....  
(3)

(Total 6 marks)

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13. Tom recorded the times, in seconds, some boys took to complete an obstacle course.  
He drew this box plot for his results.



Tom also recorded the times some girls took to complete the obstacle course.

Here are the times, in seconds, for the girls.

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 99  | 101 | 103 | 106 | 108 | 109 | 110 | 110 | 111 | 112 |
| 113 | 114 | 115 | 115 | 117 | 120 | 124 | 125 | 132 |     |

Compare the distribution of the times for the boys with the distribution of the times for the girls.

**(Total for 4 marks)**

14. (a) Write  $8.2 \times 10^5$  as an ordinary number.

.....  
(1)

- (b) Write 0.000 376 in standard form.

.....  
(1)

- (c) Work out the value of  $(2.3 \times 10^{12}) \div (4.6 \times 10^3)$   
Give your answer in standard form.

.....  
(2)

**(Total 4 marks)**

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15.

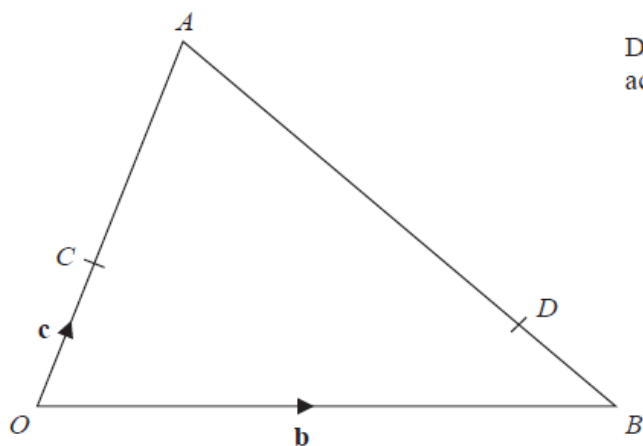


Diagram **NOT**  
accurately drawn

In the diagram,

$$\overrightarrow{OB} = \mathbf{b}$$

$$\overrightarrow{OC} = \mathbf{c}$$

$$\overrightarrow{OC} = \frac{1}{3} \overrightarrow{OA}$$

$$\overrightarrow{BD} = \frac{1}{4} \overrightarrow{BA}$$

Find  $CD$  in terms of  $\mathbf{b}$  and  $\mathbf{c}$ .

Give your answer in its simplest form.  
You must show all your working.

.....  
(Total 4 marks)

16. Two events,  $A$  and  $B$ , are mutually exclusive.

$P(A) = 0.3$

$P(B) = 0.5$

(a) Work out  $P(A')$

.....  
(1)

(b) Work out  $P(A \cup B)$

.....  
(1)

$P(C) = 0.4$

$P(D) = 0.2$

$P(C \cap D) = 0.06$

(c) Are  $C$  and  $D$  independent events?  
Explain your answer.

.....  
.....  
.....  
(2)

(Total 4 marks)

17. Simplify fully  $\frac{2x^2 + 9x - 5}{6x^2 - 5x + 1}$

.....  
(Total 3 marks)

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18.

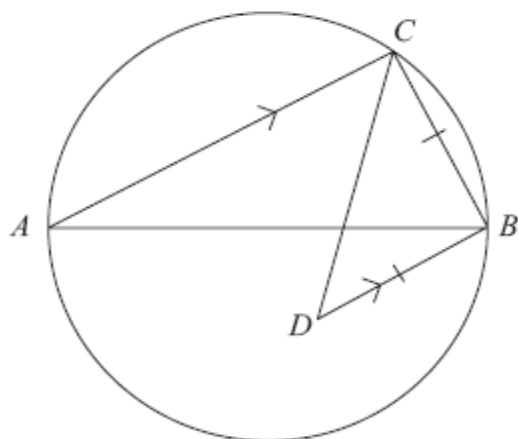


Diagram **NOT**  
accurately drawn

$AB$  is a diameter of a circle.

$C$  is a point on the circle.

$D$  is the point inside the circle such that  $BD = BC$  and  $BD$  is parallel to  $CA$ .

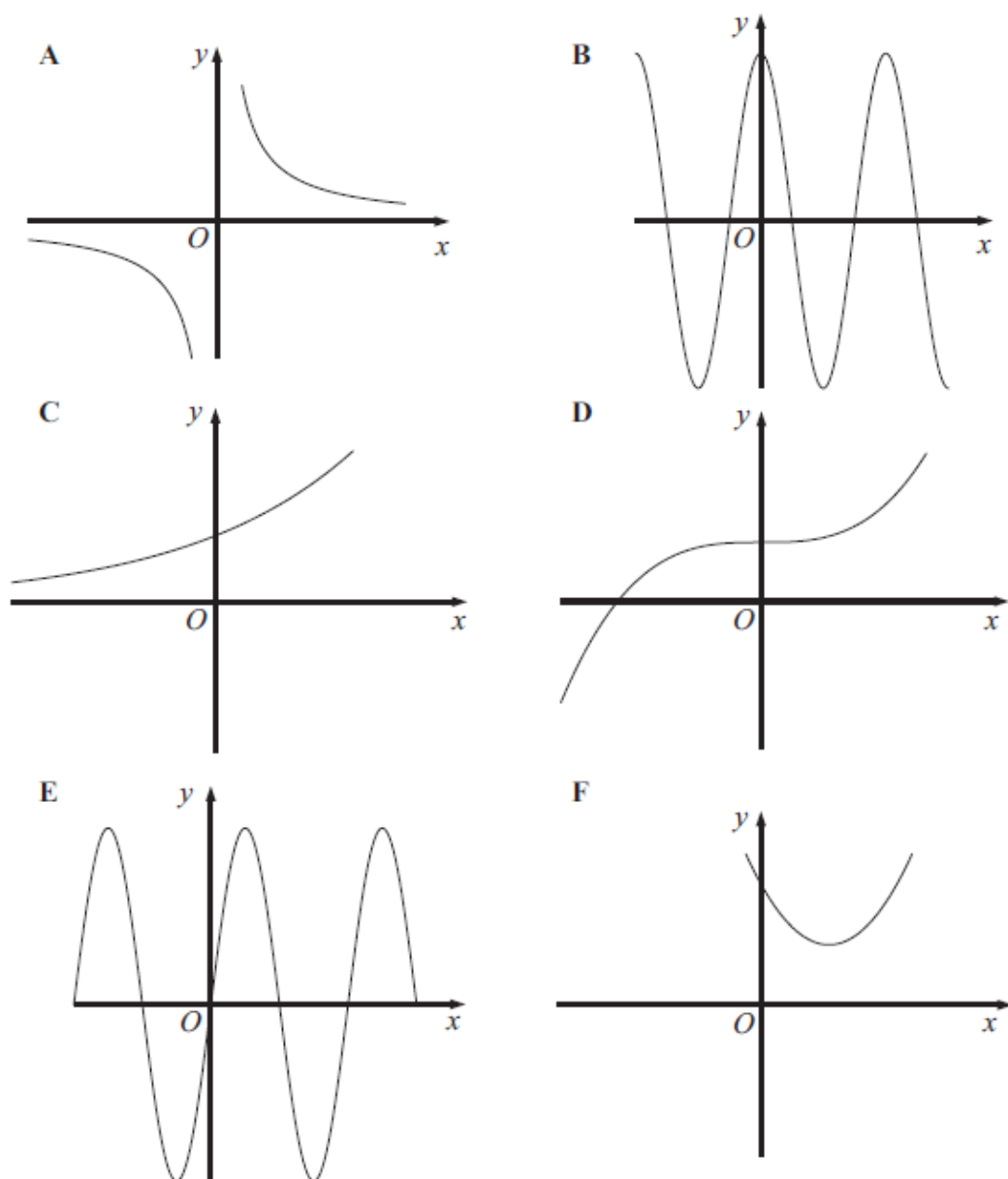
Find the size of angle  $CDB$ .

You must give reasons for your answer.

..... °

**(Total 4 marks)**

19.



Each equation in the table represents one of the graphs A to F.  
Write the letter of each graph in the correct place in the table.

| Equation             | Graph |
|----------------------|-------|
| $y = 4 \sin x^\circ$ |       |
| $y = 4 \cos x^\circ$ |       |
| $y = x^2 - 4x + 5$   |       |
| $y = 4 \times 2^x$   |       |
| $y = x^3 + 4$        |       |
| $y = \frac{4}{x}$    |       |

(Total 3 marks)



**20.** Expand  $(1 + \sqrt{2})(3 - \sqrt{2})$

Give your answer in the form  $a + b\sqrt{2}$  where  $a$  and  $b$  are integers.

.....  
**(Total 2 marks)**

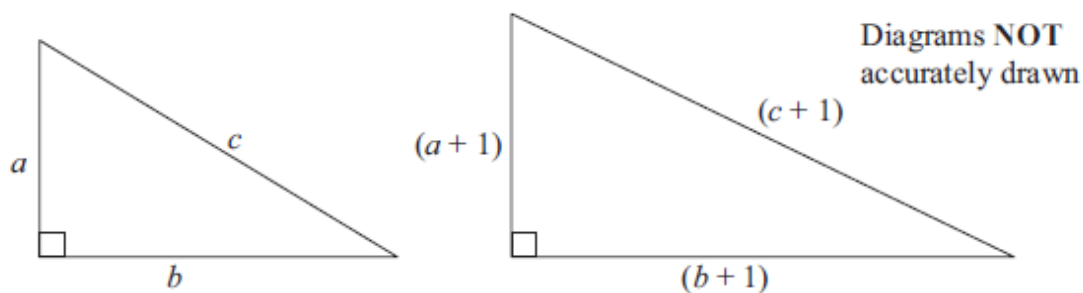
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21. Umar thinks  $(a+1)^2 = a^2 + 1$  for all values of  $a$ .

(a) Show that Umar is wrong.

(2)

Here are two right-angled triangles.  
All the measurements are in centimetres.



(b) Show that  $2a + 2b + 1 = 2c$

(3)

$a$ ,  $b$  and  $c$  cannot all be integers.

(c) Explain why.

(1)

(Total 6 marks)

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**TOTAL FOR PAPER IS 80 MARKS**