

GCSE Mathematics

Practice Tests: Set 14

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.

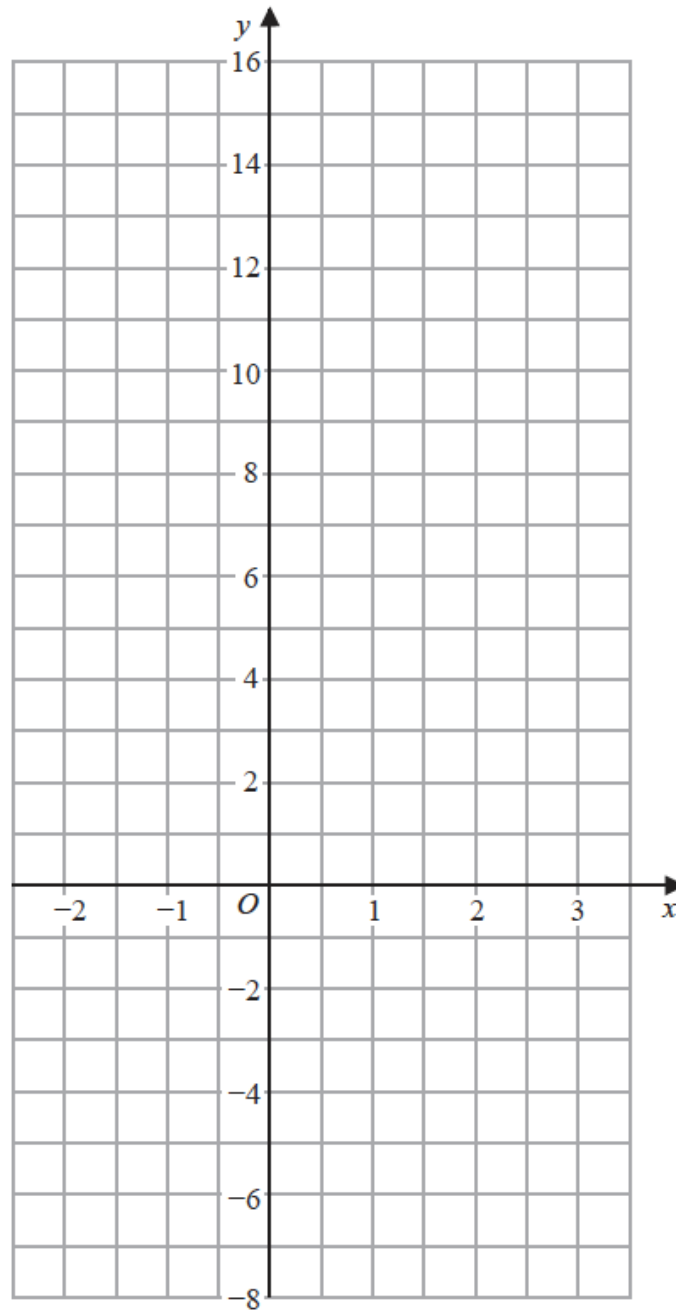
1 Solve $5(4 - x) = 7 - 3x$

Show clear algebraic working.

$x = \dots\dots\dots$

(Total for Question 1 is 1 mark)

2 On the grid, draw the graph of $y = 7 - 4x$ for values of x from -2 to 3



(Total for Question 2 is 3 marks)

3 (a) Simplify $g^6 \times g^4$

.....
(1)

(b) Simplify $k^{10} \div k^3$

.....
(1)

(c) Simplify $(3cd^4)^2$

.....
(2)

(Total for Question 3 is 4 marks)

4 Solve the simultaneous equations

$$7x - 2y = 34$$

$$3x + 5y = -3$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

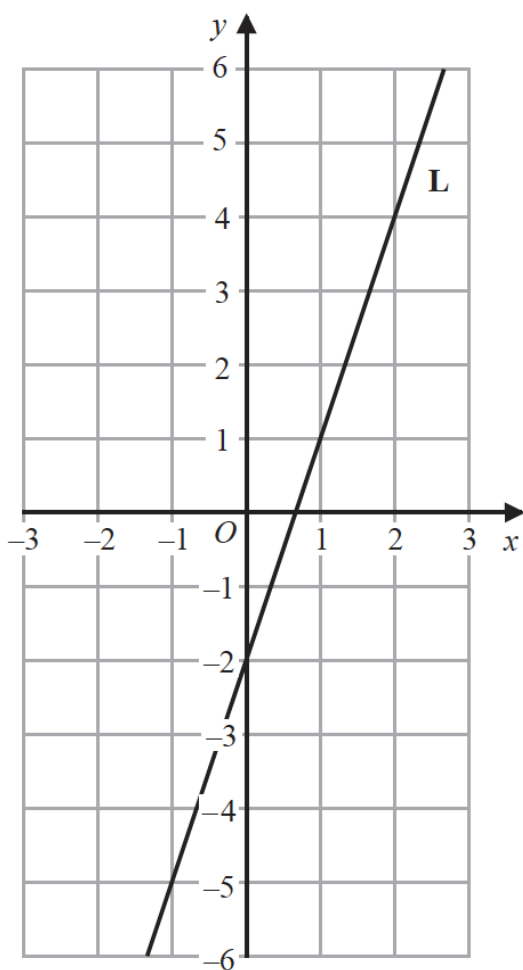
(Total for Question 4 is 4 marks)

5 Solve the inequality $4x + 7 > 2$

$$\dots\dots\dots$$

(Total for Question 5 is 2 marks)

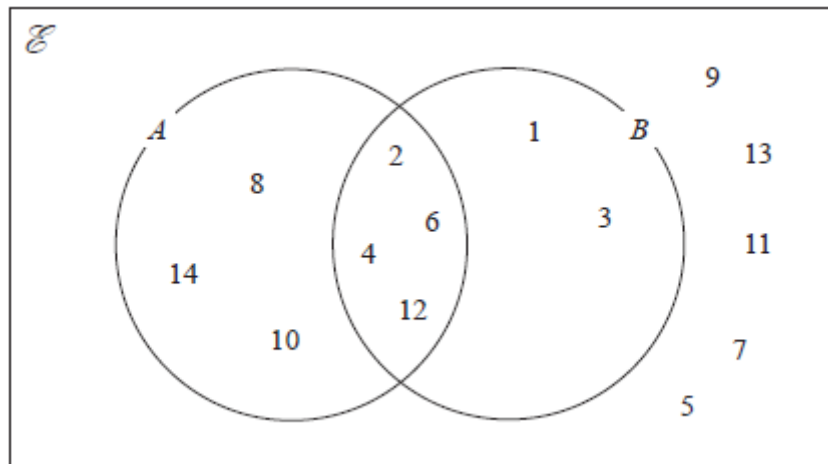
6 The line **L** is shown on the grid.



Find an equation for **L**.

.....
(Total for Question 6 is 2 marks)

7 The numbers from 1 to 14 are shown in the Venn diagram.



(a) List the members of the set $A \cap B$

.....
(1)

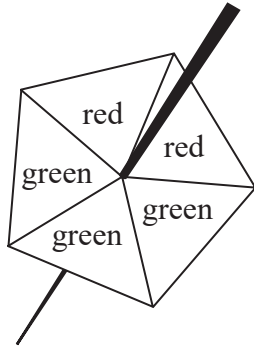
A number is picked at random from the numbers in the Venn diagram.

(b) Find the probability that this number is in set A but is **not** in set B .

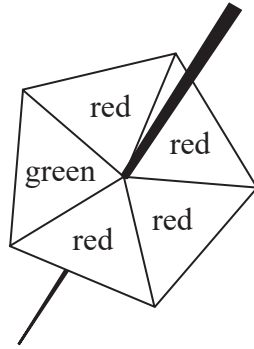
.....
(2)

(Total for Question 7 is 3 marks)

8 Harry has two fair 5-sided spinners.

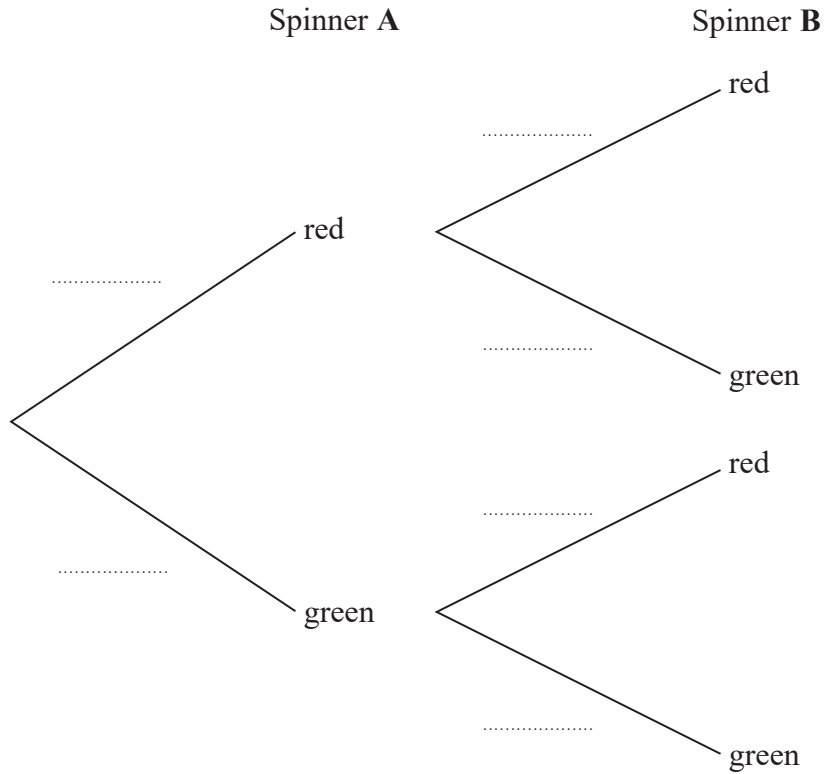


Spinner A



Spinner B

Harry is going to spin each spinner once.
 (a) Complete the probability tree diagram.



(2)

(b) Work out the probability that at least one of the spinners will land on green.

.....
(3)

(Total for Question 8 is 5 marks)

9 Solve $\frac{4x-2}{3} - \frac{5-3x}{4} = 6$

Show clear algebraic working.

$x =$

(Total for Question 9 is 4 marks)

10 Factorise fully $16m^3g^3 + 24m^2g^5$

.....
(Total for Question 10 is 2 marks)

11 Make x the subject of $y = \frac{5-2x}{x+3}$

.....
(Total for Question 11 is 4 marks)

12 F is inversely proportional to the square of v .

Given that $F = 6.5$ when $v = 4$, find a formula for F in terms of v .

.....
(Total for Question 12 is 3 marks)

13 (a) Simplify fully $(8e^{15})^{\frac{2}{3}}$

.....
(2)

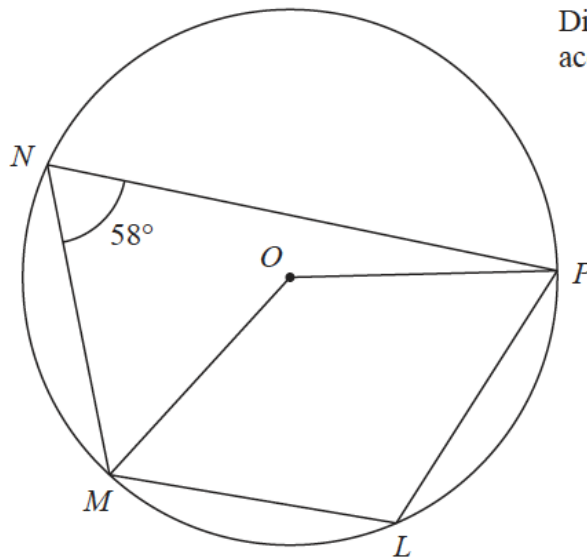
(b) Express $\left(\frac{y}{2}\right)^{-4}$ in the form ay^n where a and n are integers.

.....
(2)
(Total for Question 13 is 4 marks)

14 Use algebra to show that $0.6\bar{8}i = \frac{15}{22}$

(Total for Question 14 is 2 marks)

Diagram **NOT**
accurately drawn



L , M , N and P are points on a circle, centre O
Angle $MNP = 58^\circ$

(a) (i) Find the size of angle MLP

.....^o

(ii) Give a reason for your answer.

.....

.....

(2)

(b) Find the size of the reflex angle MOP

.....^o

(2)

(Total for Question 15 is 4 marks)

16 Rationalise the denominator of $\frac{6}{3-\sqrt{7}}$

Simplify your answer.

You must show each stage of your working.

.....
(Total for Question 16 is 3 marks)

17 Solve the simultaneous equations

$$3xy - y^2 = 8$$

$$x - 2y = 1$$

Show clear algebraic working.

.....
(Total for Question 17 is 5 marks)

18 Given that $\frac{3^x}{9^{3x}} = 81$, find the value of x .

Show clear algebraic working.

$x = \dots\dots\dots$

(Total for Question 18 is 3 marks)

19 OAB is a triangle.

$$\begin{array}{ccc} \rightarrow & & \rightarrow \\ OA = \mathbf{a} & & OB = \mathbf{b} \end{array}$$

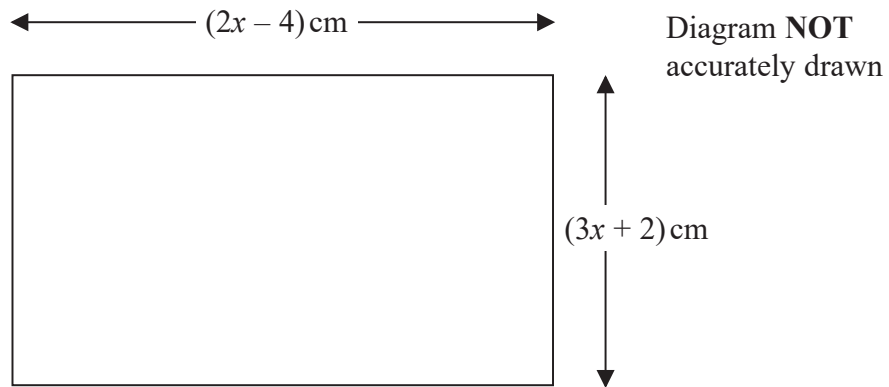
The point C lies on OA such that $OC : CA = 1 : 2$

The point D lies on OB such that $OD : DB = 1 : 2$

Using a vector method, prove that $ABDC$ is a trapezium.

(Total for Question 19 is 3 marks)

20 The diagram shows a rectangle.



The area of the rectangle is $A \text{ cm}^2$

Given that $A < 3x + 27$

find the range of possible values for x .

.....
(Total for Question 20 is 5 marks)

21 Express

$$\frac{1}{3x-2} \times \frac{9x^2-4}{3x^2-13x-10} - \frac{7}{x-1}$$

as a single fraction in its simplest form.

.....
(Total for Question 21 is 5 marks)

22 The function f is such that $f(x) = 5 + 6x - x^2$ for $x \leq 3$

(a) Express $5 + 6x - x^2$ in the form $p - (x - q)^2$ where p and q are constants.

.....
(2)

(b) Using your answer to part (a), find the range of values of x for which $f^{-1}(x)$ is positive.

.....
(5)
(Total for Question 22 is 7 marks)

TOTAL FOR PAPER IS 80 MARKS