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.

$x =$ .....

(Total for Question 1 is 1 mark)

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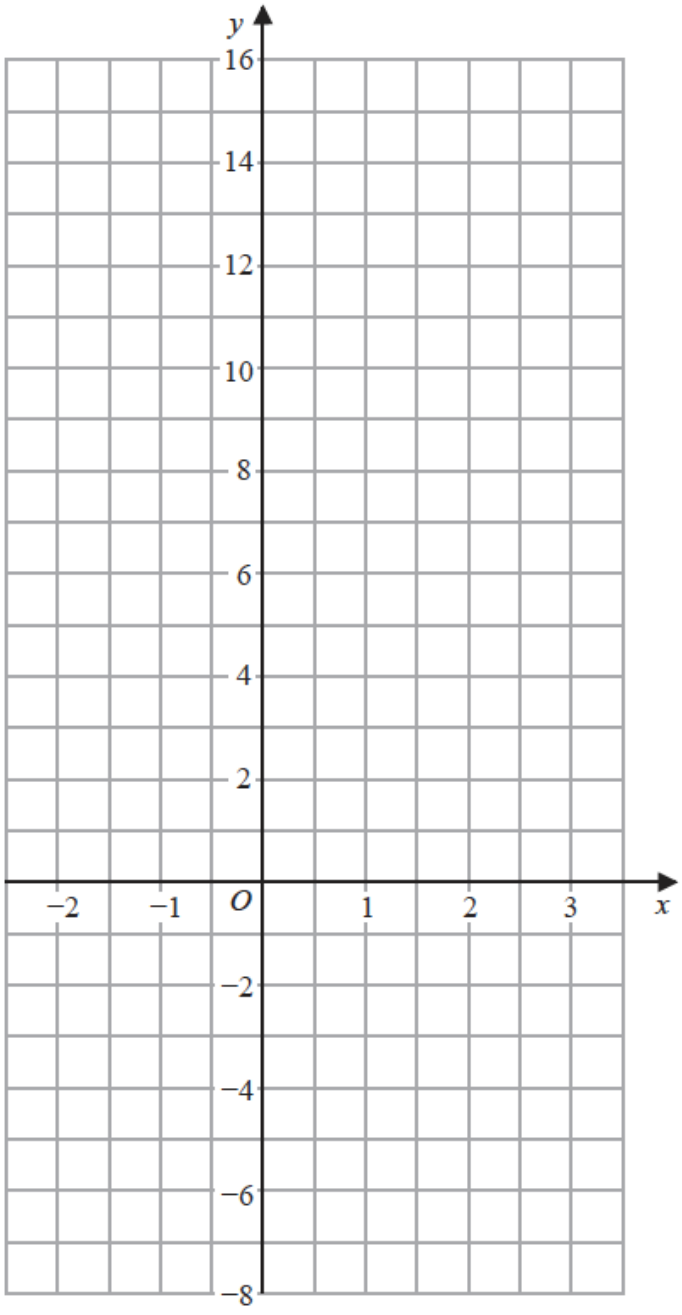
2 On the grid, draw the graph of $y = 7 - 4x$ for values of x from -2 to 3



(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)

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4 Solve the simultaneous equations

$$7x - 2y = 34$$

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

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 4 is 4 marks)

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

.....

(Total for Question 5 is 2 marks)

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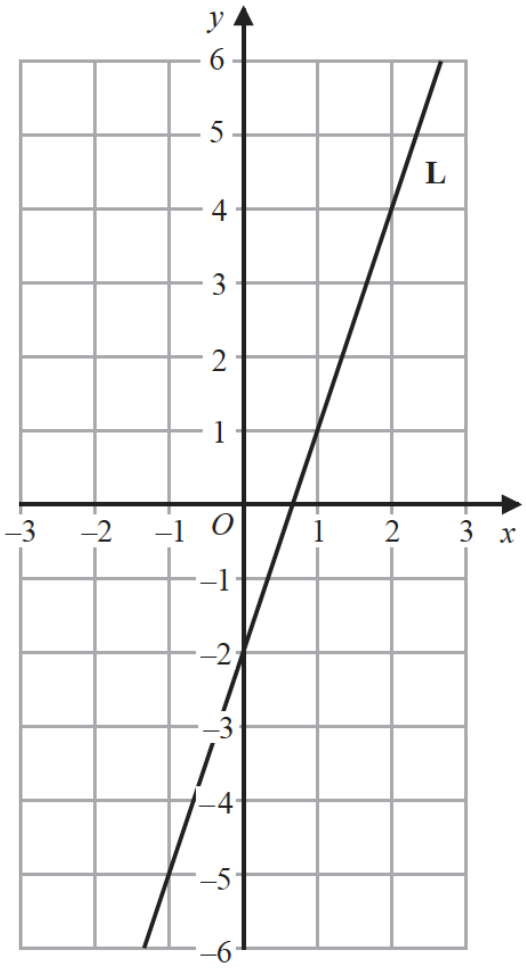
6 The line **L** is shown on the grid.

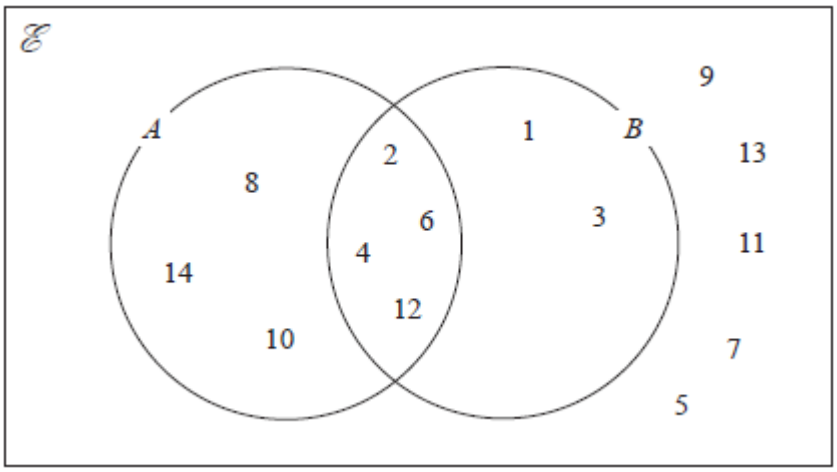


Find an equation for **L**.

.....

(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.

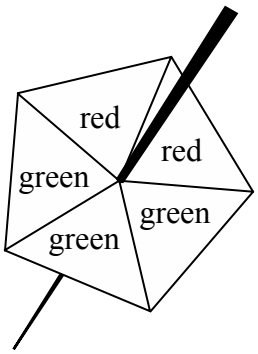
(*b*) Find the probability that this number is in set A but is **not** in set B.

.....

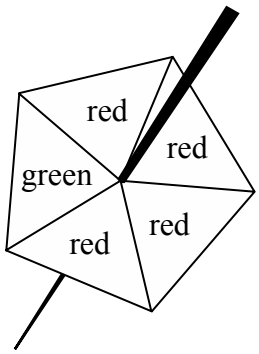
(2)

(Total for Question 7 is 3 marks)

8 Harry has two fair 5-sided spinners.

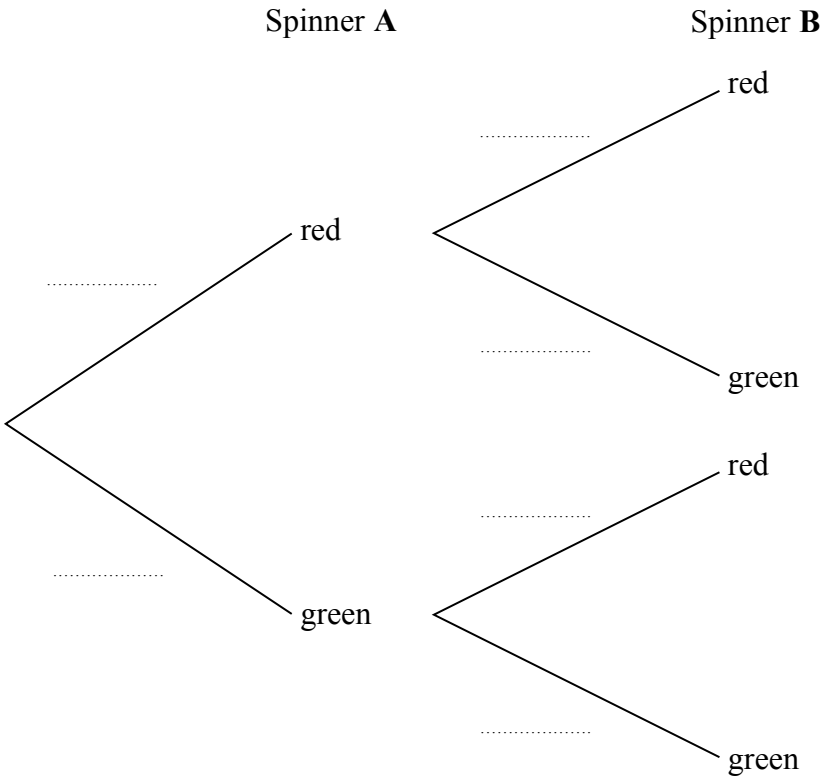


Spinner **A**



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)

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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 $y = \dfrac{5 - 2x}{x + 3}$

.....

(Total for Question 11 is 4 marks)

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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)

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14 Use algebra to show that $0.6\dot{8}\dot{1} = \frac{15}{22}$

(Total for Question 14 is 2 marks)

15

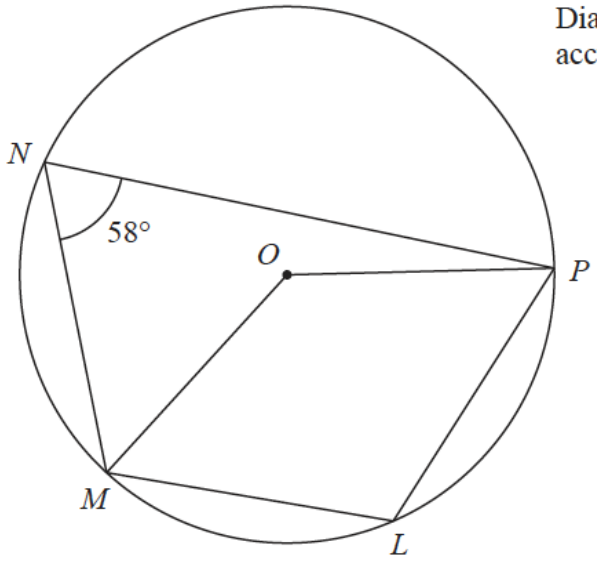

Diagram **NOT** accurately drawn

L, *M*, *N* and *P* are points on a circle, centre *O*
Angle *MNP* = 58°

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

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(*b*) Find the size of the reflex angle *MOP*

.....°

(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)

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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.

$x =$ .....

(Total for Question 18 is 3 marks)

19 OAB is a triangle.

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

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.

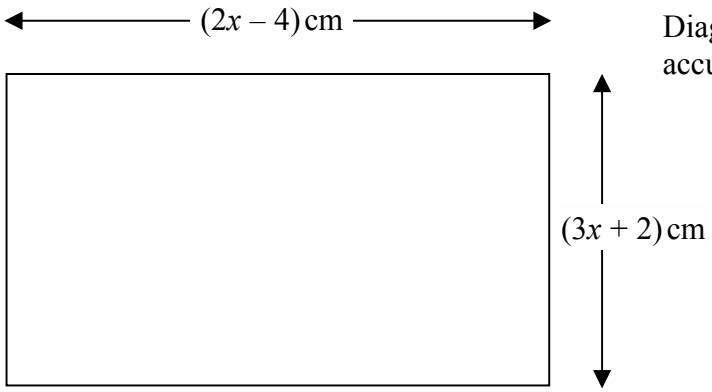

Diagram **NOT** accurately drawn

The area of the rectangle is A 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