GCSE Grade 7

Maths Booklet 4

Paper 1H
Non-Calculator

1 Sally plays two games against Martin.
In each game, Sally could win, draw or lose.

In each game they play,
the probability that Sally will win against Martin is 0.3
the probability that Sally will draw against Martin is 0.1

Work out the probability that Sally will win **exactly** one of the two games against Martin.

....

(Total for Question 1 is 3 marks)

2 The straight line L_1 has equation $y = 3x - 4$
The straight line L_2 is perpendicular to L_1 and passes through the point (9, 5)

Find an equation of line L_2

....

(Total for Question 2 is 3 marks)

3 Shirley wants to find an estimate for the number of bees in her hive.

On Monday she catches 90 of the bees.
She puts a mark on each bee and returns them to her hive.

On Tuesday she catches 120 of the bees.
She finds that 20 of these bees have been marked.

(a) Work out an estimate for the total number of bees in her hive.

....

(3)

Shirley assumes that none of the marks had rubbed off between Monday and Tuesday.

(b) If Shirley's assumption is wrong, explain what effect this would have on your answer to part (a).

....

....

....

(1)

(Total for Question 3 is 4 marks)

4 Make f the subject of the formula $\quad d = \dfrac{3\,(1 - f)}{f - 4}$

....

(Total for Question 4 is 4 marks)

5 x is proportional to $\sqrt{y}$ where $y > 0$

y is increased by 44%

Work out the percentage increase in x.

....%

(Total for Question 5 is 3 marks)

6 Here is a shape with all its measurements in centimetres.

$x + 1$

4

$x + 11$

$2x + 6$
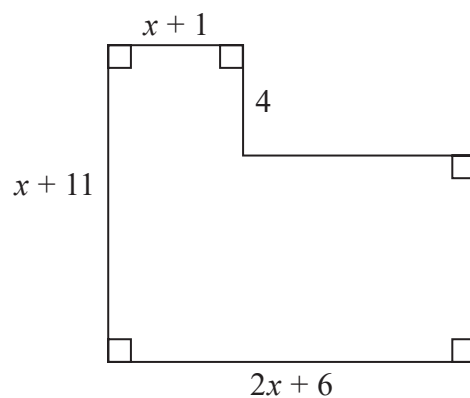
The area of the shape is A cm^2

Show that $A = 2x^2 + 24x + 46$

(Total for Question 6 is 3 marks)

7 Show that $\dfrac{4x + 3}{2x} + \dfrac{3}{5}$ can be written in the form $\dfrac{ax + b}{cx}$ where a, b and c are integers.

(Total for Question 7 is 3 marks)

8 There are only 3 red counters and 5 yellow counters in a bag.

Jude takes at random 3 counters from the bag.

Work out the probability that he takes exactly one red counter.

....

(Total for Question 8 is 4 marks)
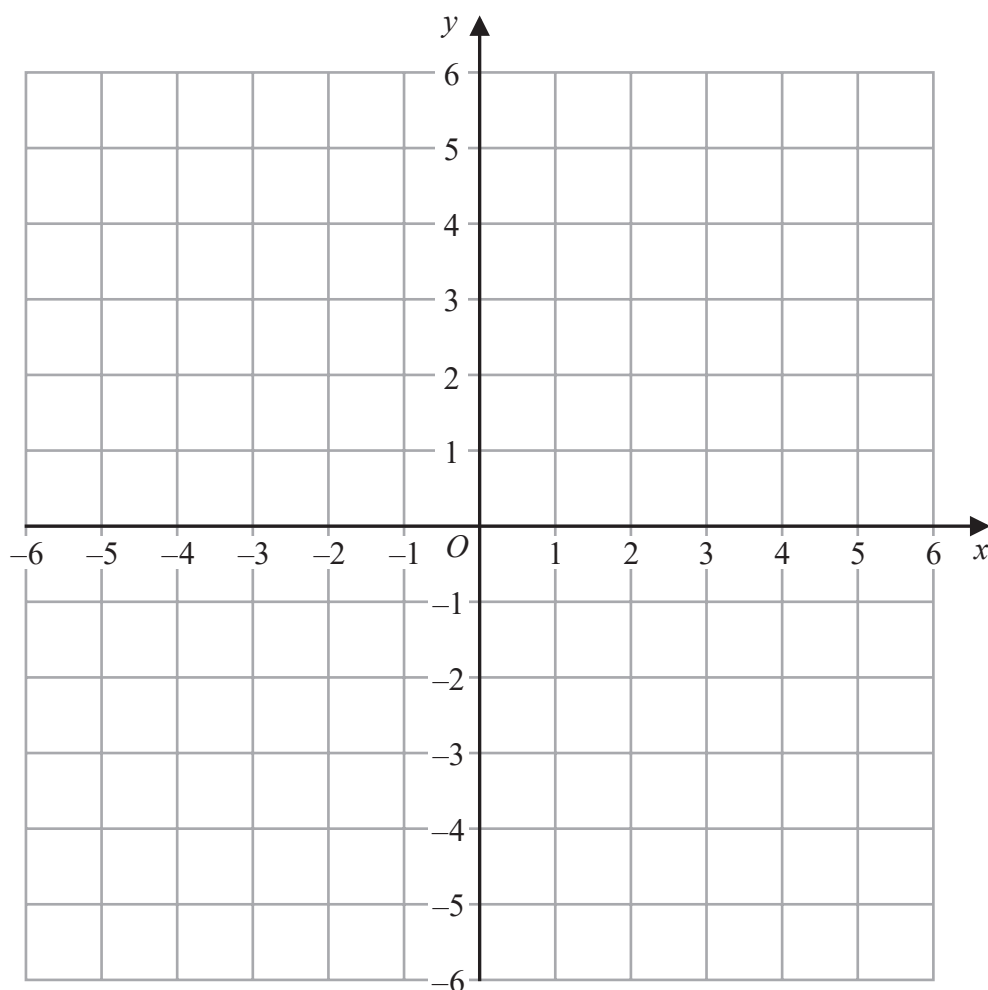
Turn over ▶

9 On the grid show, by shading, the region that satisfies all of these inequalities.

$$2y + 4 < x \qquad x < 3 \qquad y < 6 - 3x$$

Label the region **R**.

(Total for Question 9 is 3 marks)