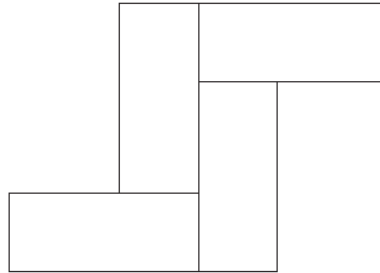**1** Here is a rectangle.

The length of the rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.
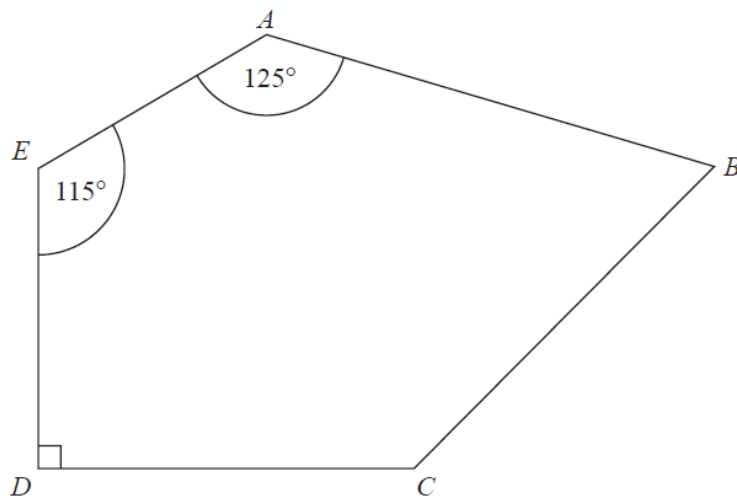
The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape.

.... cm²

(Total for Question   is 5 marks)

2 *ABCDE* is a pentagon.

Angle $BCD = 2 \times$ angle ABC

Work out the size of angle BCD.
You must show all your working.

.... °

(Total for Question   is 5 marks)

3   Here are two right-angled triangles.
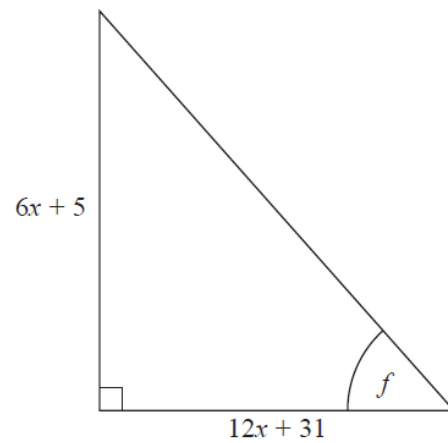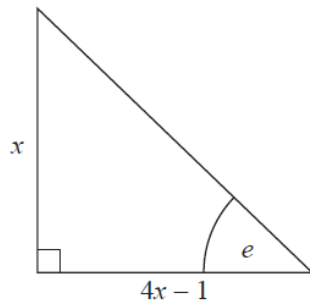
Given that

$$\tan e = \tan f$$

find the value of x.

You must show all your working.

....

(Total for Question   is 5 marks)

4   Here are two rectangles.
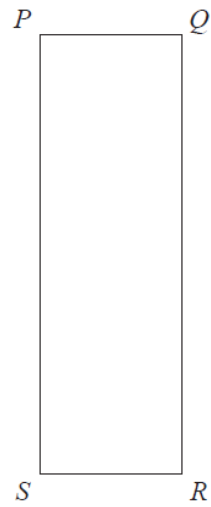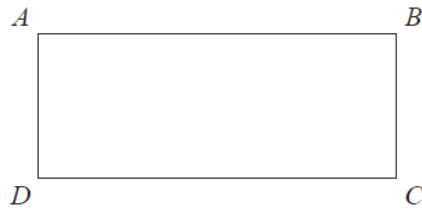
$QR = 10\,\text{cm}$
$BC = PQ$

The perimeter of $ABCD$ is $26\,\text{cm}$
The area of $PQRS$ is $45\,\text{cm}^2$

Find the length of AB.

.... cm

(Total for Question   is 4 marks)

5 The diagram shows triangle ABC.
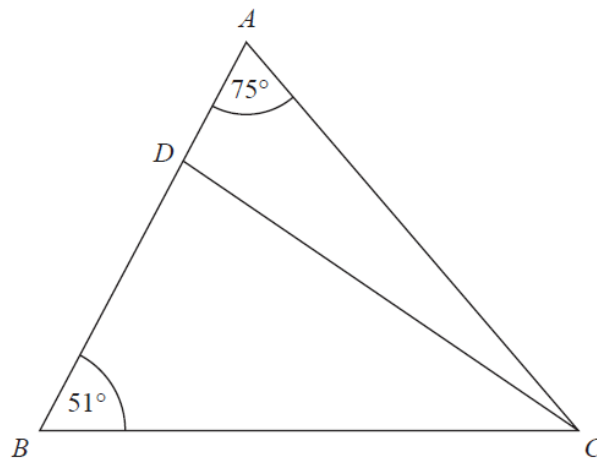
ADB is a straight line.

the size of angle DCB : the size of angle ACD = 2 : 1

Work out the size of angle BDC.

.... °

(Total for Question is 4 marks)

6   Here are two squares, **A** and **B**.

A

B

The length of each side of square **B** is 4 cm greater than the length of each side of square **A**.
The area of square **B** is 70 cm^2 greater than the area of square **A**.
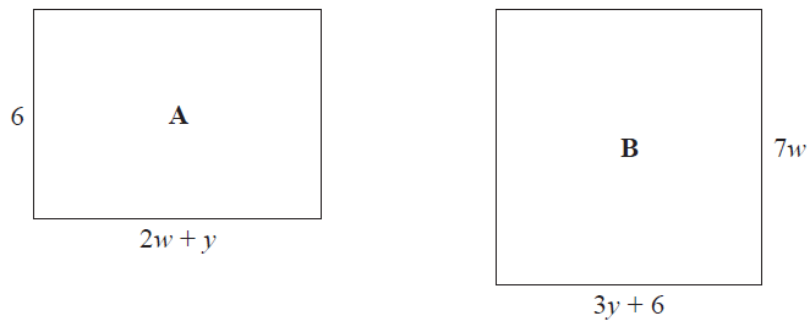
Find the area of square **B**.
Give your answer correct to 3 significant figures.
You must show all your working.

.... cm^2

(Total for Question   is 4 marks)

7 The diagram shows two rectangles, **A** and **B**.

6 | **A**

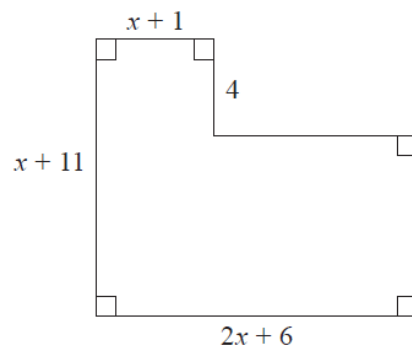$2w + y$

B | $7w$

$3y + 6$

All measurements are in centimetres.

The area of rectangle **A** is equal to the area of rectangle **B**.

Find an expression for y in terms of w.

....

(Total for Question   is 4 marks)

8   Here is a shape with all its measurements in centimetres.
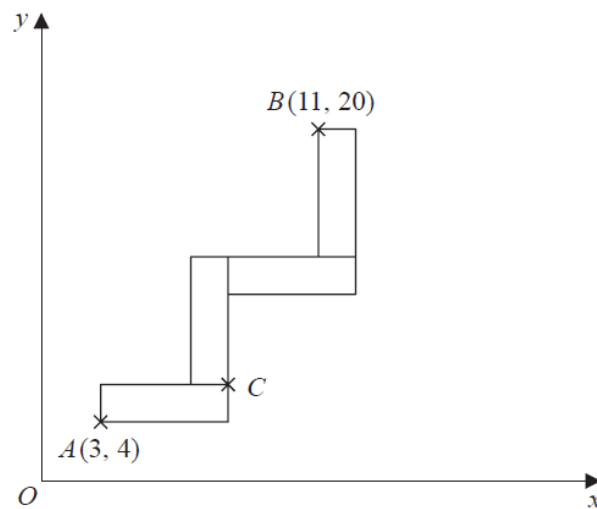
$x + 1$

4

$x + 11$

$2x + 6$

The area of the shape is A cm^2

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

(Total for Question   is 3 marks)

9 A pattern is made from four identical rectangles.
The sides of the rectangles are parallel to the axes.

Point A has coordinates $(3, 4)$
Point B has coordinates $(11, 20)$
Point C is marked on the diagram.

Work out the coordinates of C.
You must show all your working.

(......................... , ...)

(Total for Question   is 5 marks)

10   Olivia and Jessica have in total half as many sweets as Fran and Gary have in total.

Fran and Gary share their sweets in the ratio $2:3$
Olivia and Jessica share their sweets in the ratio $9:1$

Fran got w sweets.
Gary got x sweets.
Olivia got y sweets.
Jessica got z sweets.

Find, in its simplest form, $w:x:y:z$

....

(Total for Question   is 4 marks)

11   The curve **C** has equation $y = x^2 + 3x - 3$

The line **L** has equation $y - 5x + 4 = 0$

Show, algebraically, that **C** and **L** have exactly one point in common.

(Total for Question   is 4 marks)

12   Pat throws a fair coin n times.

Find an expression, in terms of n, for the probability that Pat gets at least 1 head and at least 1 tail.

(Total for Question   is 2 marks)