8 The mass of a radioactive substance is decreasing by 10% a year.
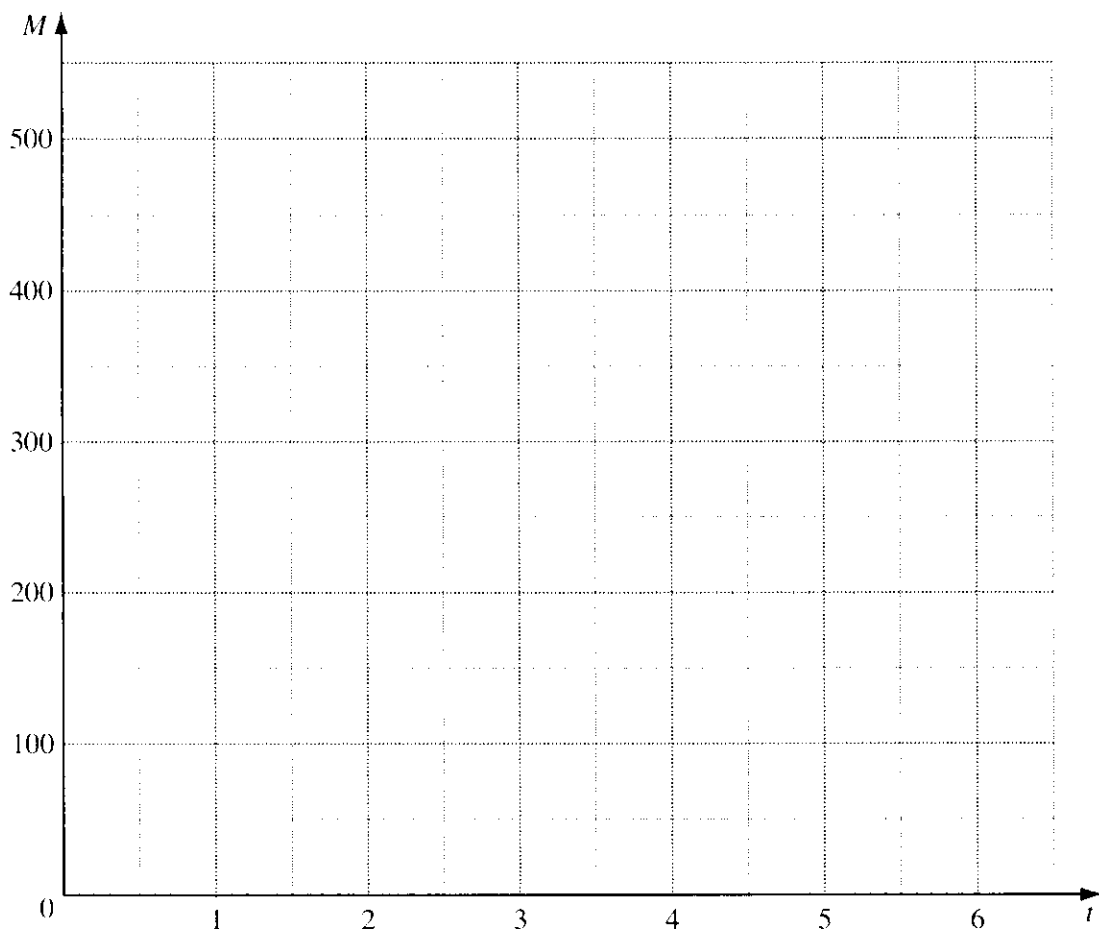
The mass, M grams, after t years, is given by the formula $M = 500 \times 0.9^t$.

(a) Complete this table.

t (years)	0	1	2	3	4	5	6
M (grams)		450			328		266

[2]

(b) Draw the graph of $M = 500 \times 0.9^t$.

[2]

(c) Use your graph to estimate after how long the mass will be 350 grams.

(c) .... years [1]

5

[Turn over

9 Mike has measured his rectangular lawn.
The length is 13 metres and the width is 7 metres.
Both measurements are correct to the nearest metre.

Calculate the upper bound for the area of the lawn.

.....................................m^2 [2]

10 At Hightown School there are 45 boys and 55 girls in Year 11
and 60 boys and 40 girls in Year 10.

A pupil is chosen at random from each year.

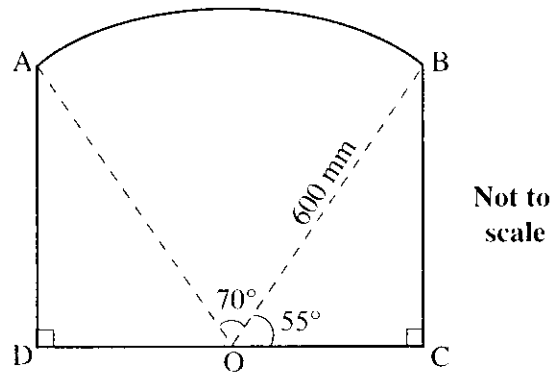Work out the probability that one boy and one girl will be chosen.

.... [3]

5

11 This diagram shows the frame of a window.
The window has one line of symmetry.

OB = 600 mm.

Not to scale

(a) Angle BOC = 55°.

Calculate BC, correct to the nearest millimetre.

(a) ....mm [3]

(b) AOB is the sector of a circle, centre O.
Angle AOB = 70°.

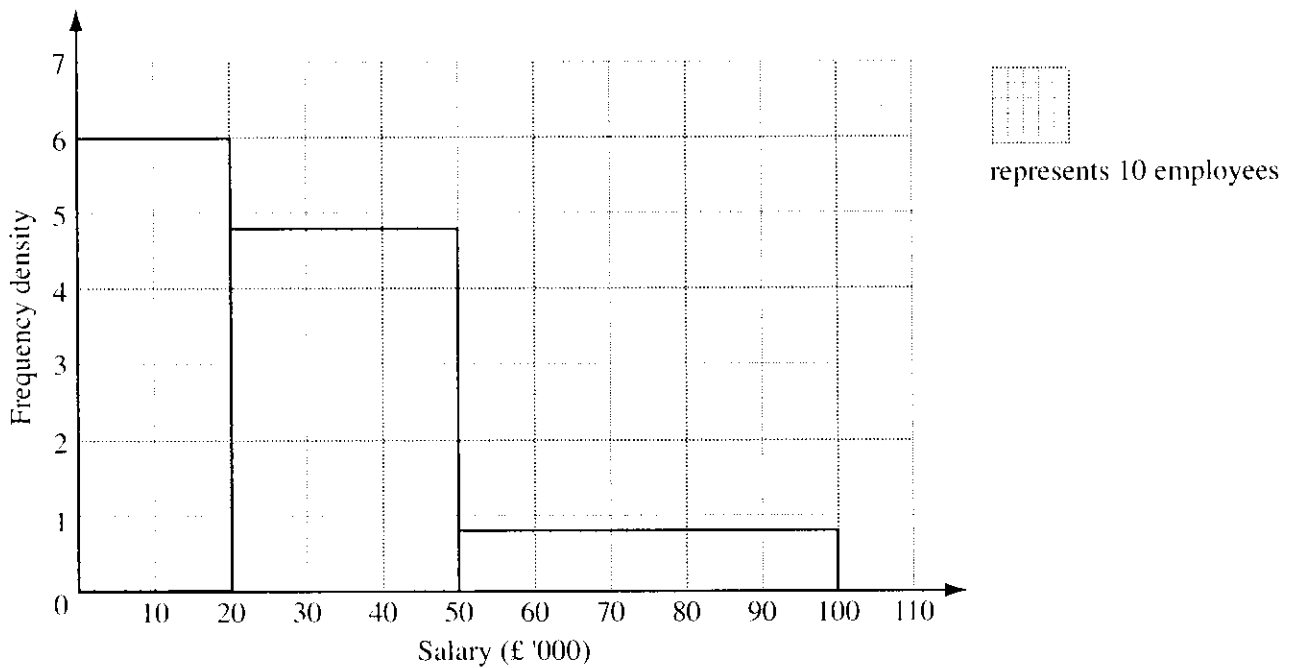Show that the length of the arc AB is 733 mm, correct to the nearest millimetre.

....

....

.... [2]

(c) Calculate the total length, ABCD, of the window frame.

(c) ....mm [3]

12 This histogram shows the distribution of the salaries of all the employees in a company.

represents 10 employees

Use the histogram to decide whether these statements are true or false, or whether there is not enough information to decide.

(a) The highest salary in the company is £100 000.

Tick the correct box.

True		False		Not enough information	

Explain your answer.

....

.... [1]

(b) There are more employees earning up to £20 000 than earning between £20 000 and £50 000.

Tick the correct box.

True		False		Not enough information	

Explain your answer.

....

.... [1]

(c) There are 304 employees altogether in the company.

Tick the correct box.

True		False		Not enough information	

Explain your answer.

....

.... [1]

⌐3⌐

13 Julie has made a scale model of St Bede's Church.
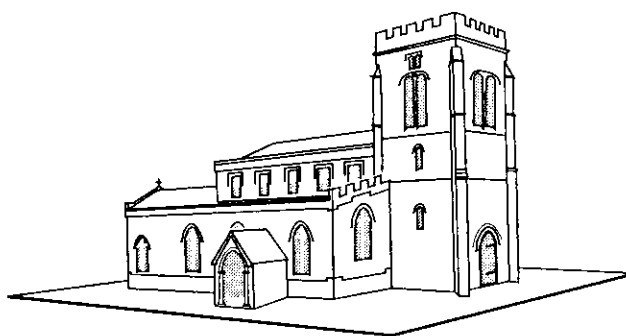
The height of the model is 32 cm.
The height of the real church is 16 m.

(a) Work out the scale that Julie used.
Write your answer in the form 1 : *n*.

(a) 1 : .... [1]

(b) The area of the floor of the church is 140 m².

Work out the area of the floor of the model.
Write your answer in square centimetres.

(b) ....cm² [3]

⌐4⌐