

Candidate Forename		Candidate Surname	
---------------------------	--	--------------------------	--

Centre Number						Candidate Number				
----------------------	--	--	--	--	--	-------------------------	--	--	--	--

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B282A

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

TERMINAL PAPER – SECTION A (Higher Tier)

FRIDAY 15 JANUARY 2010: Morning

DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Question Paper

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Geometrical instruments

Tracing paper (optional)

WARNING

**No calculator can be used for
Section A of this paper.**

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

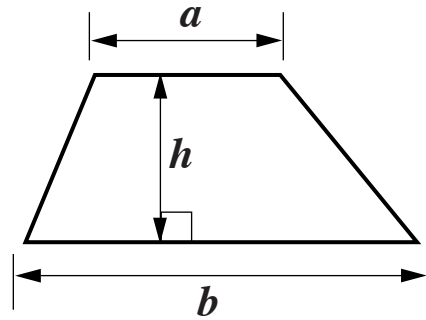
INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this Section is 50.**

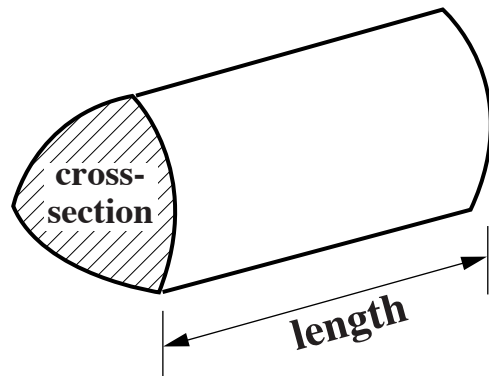
BLANK PAGE

FORMULAE SHEET

Area of trapezium = $\frac{1}{2}(a + b)h$



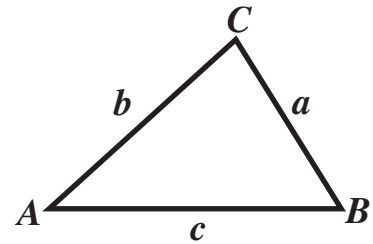
Volume of prism =
(area of cross-section) \times length



In any triangle ABC

Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

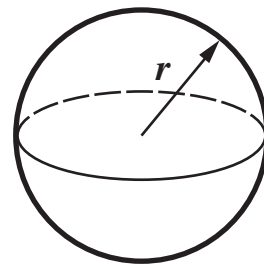
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$



Area of triangle = $\frac{1}{2} ab \sin C$

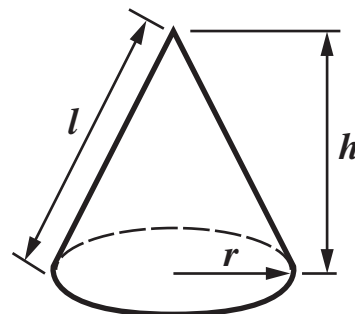
Volume of sphere = $\frac{4}{3} \pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3} \pi r^2 h$

Curved surface area of cone = $\pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- 1 (a) Divide 2.124 by 0.09.
[3 marks]**

(a) _____

(b) A cuboid measures 2·8 cm by 5·9 cm by 5·1 cm.

Estimate the volume of the cuboid.

Show the estimates you use.

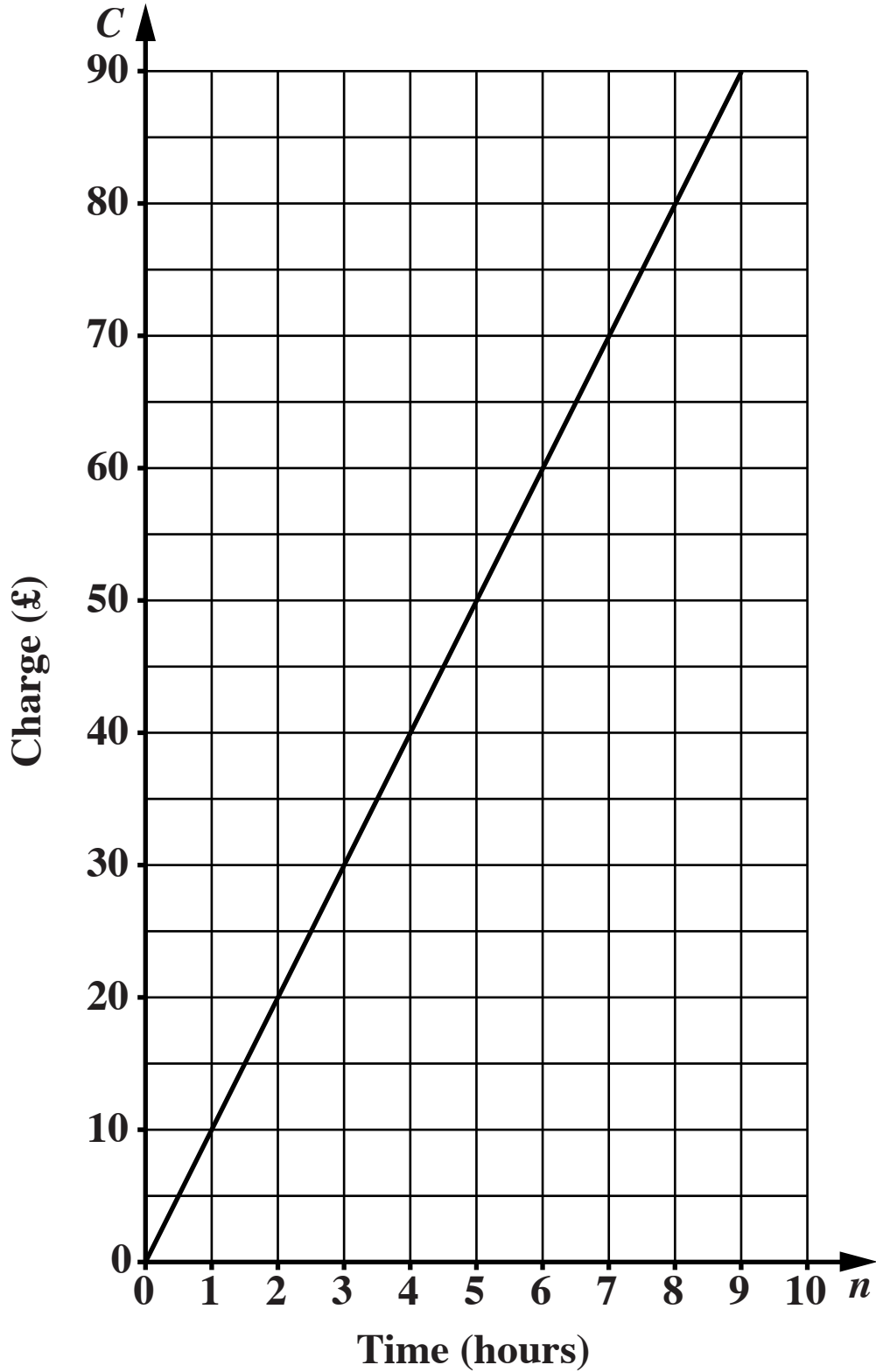
Give the units of your answer.

[3 marks]

(b) _____

2 *Cleanit!* and *SpickandSpan* are two companies offering cleaning services.

This graph shows how much *Cleanit!* charges for its cleaning services.



- (a) How much does *Cleanit!* charge for $2\frac{1}{2}$ hours of cleaning?
[1 mark]

(a) £ _____

- (b) *SpickandSpan* uses this formula to calculate its charge for cleaning.

$$C = 5 + 8n$$

C is the charge in £,
 n is the number of hours.

- (i) Complete this table for the charges for *SpickandSpan*.
[1 mark]

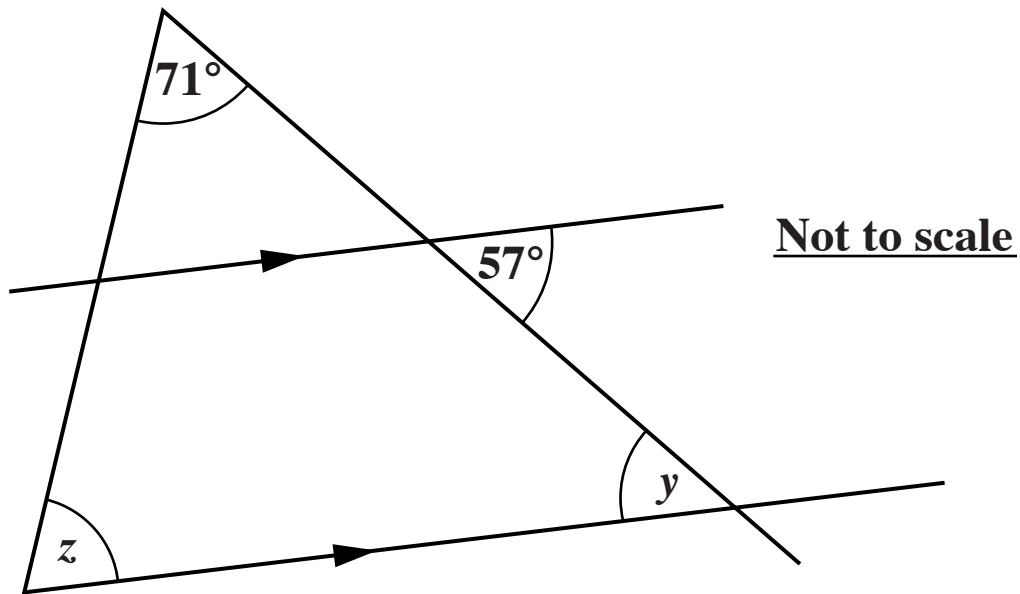
n	1	5	10
C			

- (ii) Draw the graph of the charges of *SpickandSpan* on the same grid as those for *Cleanit!*.
[2 marks]
- (c) Jenny needs to have her offices cleaned.
The cleaning will take 8 hours each week.

Which of these two cleaning firms will be cheaper and by how much each week?
[2 marks]

(c) _____ by £ _____ [2]

3 Look at the diagram below.



Find angles y and z , giving your reasons.

$y =$ _____ $^\circ$ because _____

[2 marks]

$z =$ _____ $^\circ$ because _____

[2 marks]

4 Work these out.

Give your answers as fractions in their lowest terms.

(a) $\frac{3}{5} + \frac{1}{3}$

[2 marks]

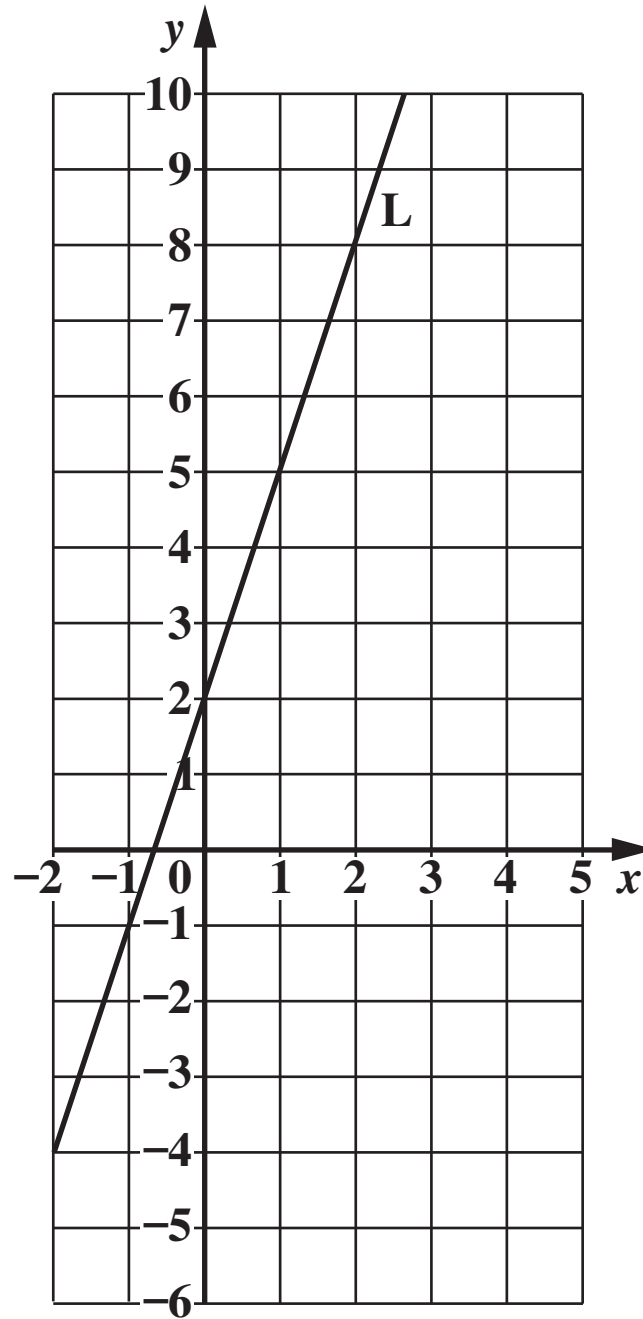
(a) _____

(b) $1\frac{2}{3} \times \frac{3}{10}$

[3 marks]

(b) _____

5 Look at the diagram below.



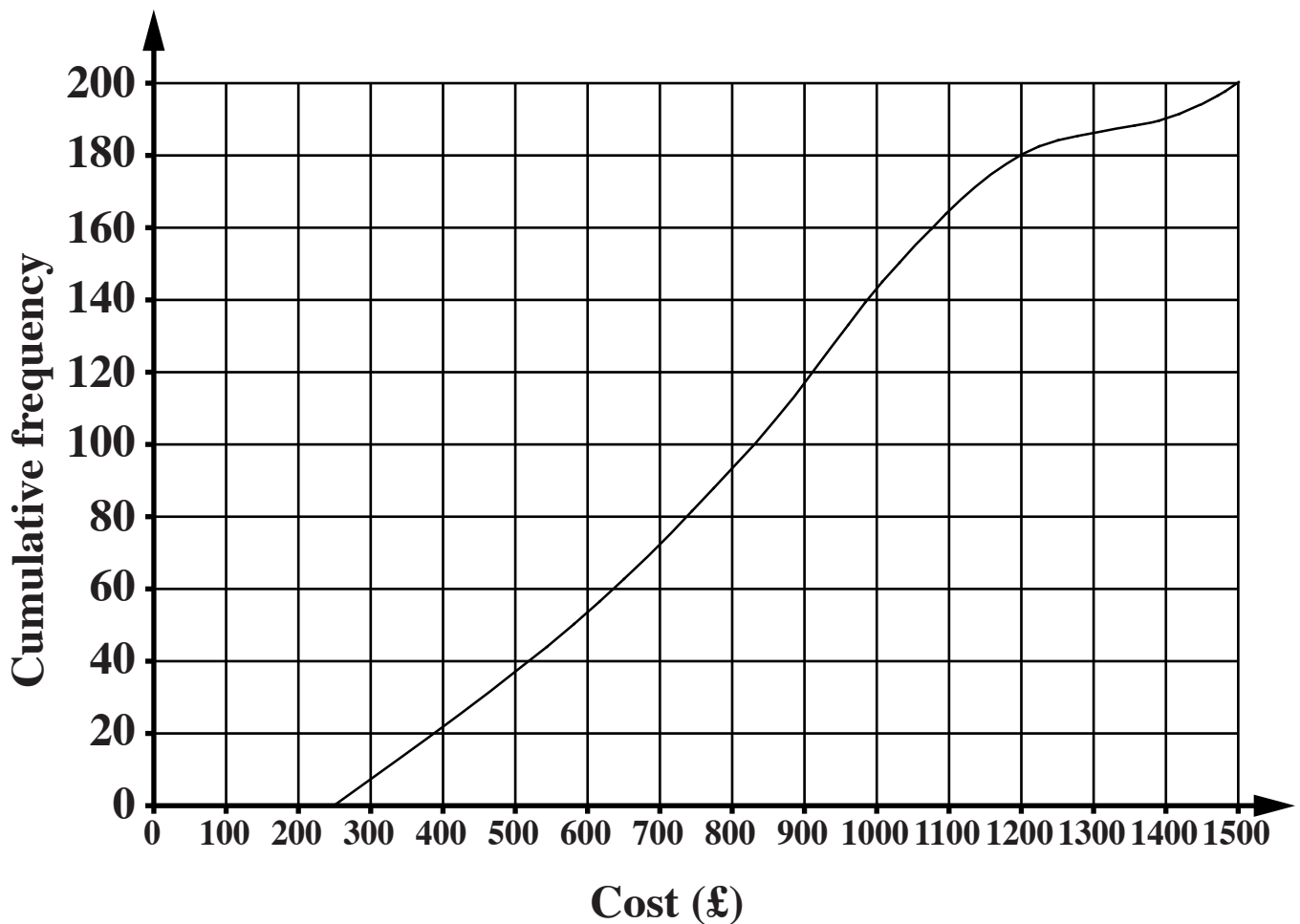
(a) Find the gradient of line L.
[2 marks]

(a) _____

(b) Find the equation of line L.
[2 marks]

(b) _____

- 6** Juanita surveyed the cost of 200 holidays.
This cumulative frequency graph represents her results.



- (a)** How many of these holidays cost less than £800?
[1 mark]

(a) _____

- (b)** Find the median cost.
[1 mark]

(b) £ _____

(c) Find the interquartile range.
[2 marks]

(c) £ _____

7 (a) Rearrange this formula to make x the subject.

$$y = x^3 + 5$$

[2 marks]

(a) _____

(b) Simplify.

$$a(n + 1)^2 - an^2$$

[2 marks]

(b) _____

(c) Each of these sketch graphs has one of the following equations.

$$y = x^2 + 5$$

$$y = 5^x$$

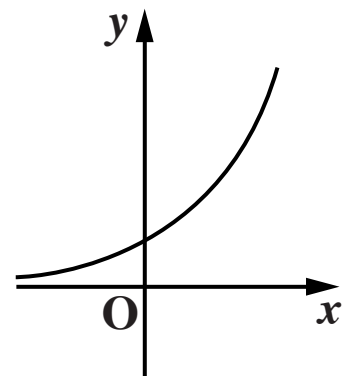
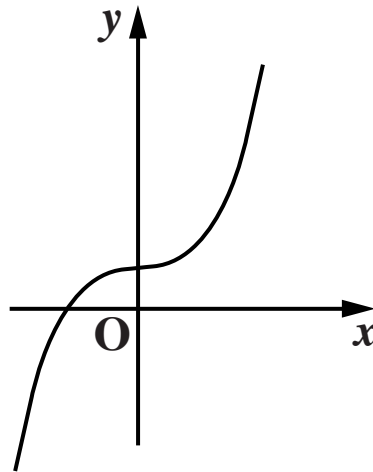
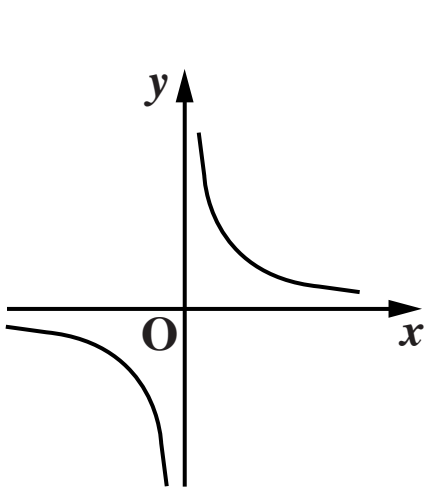
$$y = x^3 + 5$$

$$y = \frac{5}{x}$$

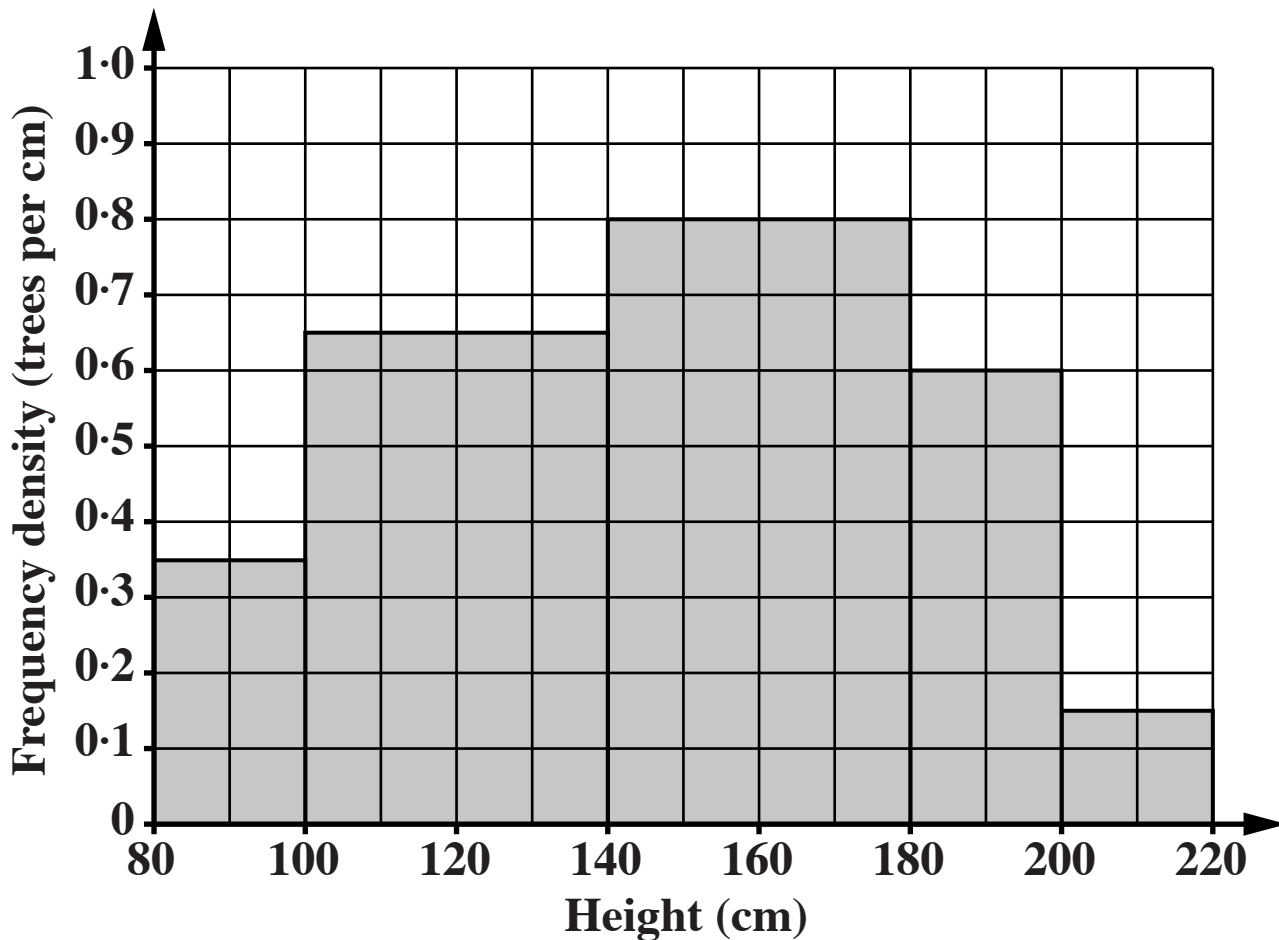
$$y = \frac{1}{x} + 5$$

$$y = 5x^2$$

Write the correct equation under each graph.
[3 marks]



- 8 A plant nursery measured the heights of some birch trees and some ash trees two years after planting. This histogram represents the heights of the birch trees.



- (a) How many of these birch trees had height 180 to 200 cm two years after planting?
[1 mark]

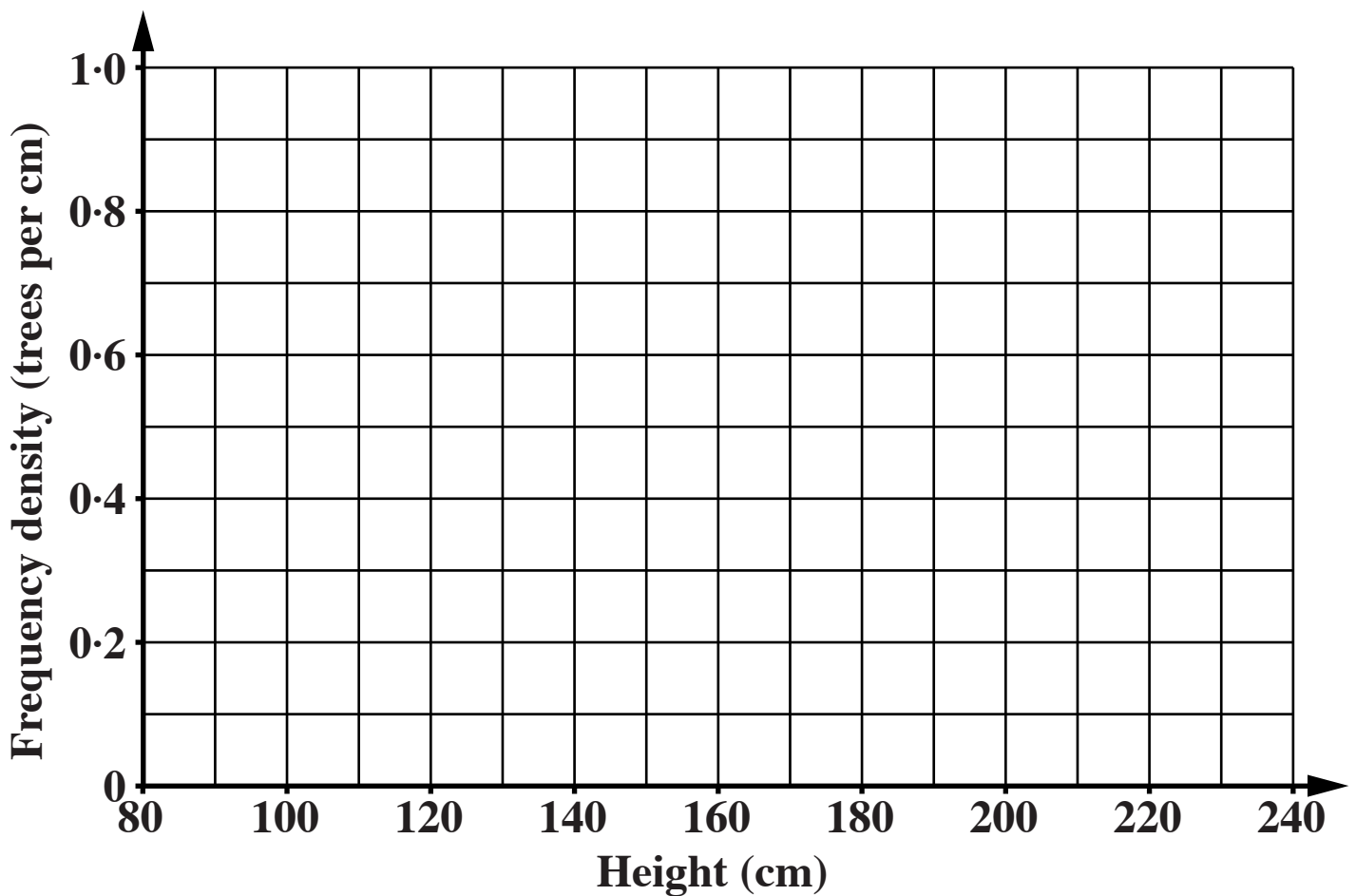
(a) _____

(b) This table summarises data for the heights of the ash trees.

Height (h cm)	Frequency
$100 < h \leq 140$	12
$140 < h \leq 180$	30
$180 < h \leq 200$	18
$200 < h \leq 220$	14
$220 < h \leq 240$	6

On this grid, draw a histogram to represent the heights of the ash trees.

[3 marks]



(c) Make one comparison between the heights of the birch trees and the ash trees.

[1 mark]

9 (a) Write $0.\dot{5}\dot{1}$ as a fraction in its lowest terms.
[3 marks]

(a) _____

(b) Write $5\sqrt{2} + \sqrt{18}$ in the form $a\sqrt{b}$, where a and b are integers and b is as small as possible.
[2 marks]

(b) _____

(c) Simplify.

$$\frac{15x^5y}{5x^2y^3}$$

[2 marks]

(c) _____

(d) Evaluate.

$$64^{-\frac{2}{3}}$$

[2 marks]

(d) _____

BLANK PAGE

BLANK PAGE

Copyright Information

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations, is given to all schools that receive assessment material and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.