

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
TERMINAL PAPER – SECTION A (Higher Tier)

B282A

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

Friday 15 January 2010
Morning

Duration: 1 hour



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- 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.
- Do **not** write in the bar codes.
- 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**.
- This document consists of **12** pages. Any blank pages are indicated.

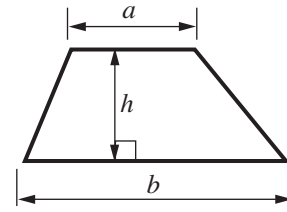
WARNING



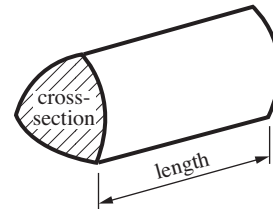
No calculator can be used for Section A of this paper

Formulae Sheet

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



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

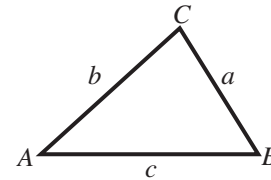


In any triangle ABC

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

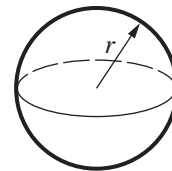
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



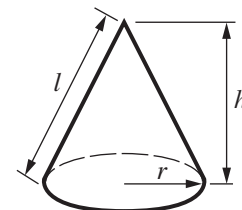
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

PLEASE DO NOT WRITE ON THIS PAGE

1 (a) Divide 2.124 by 0.09.

(a) [3]

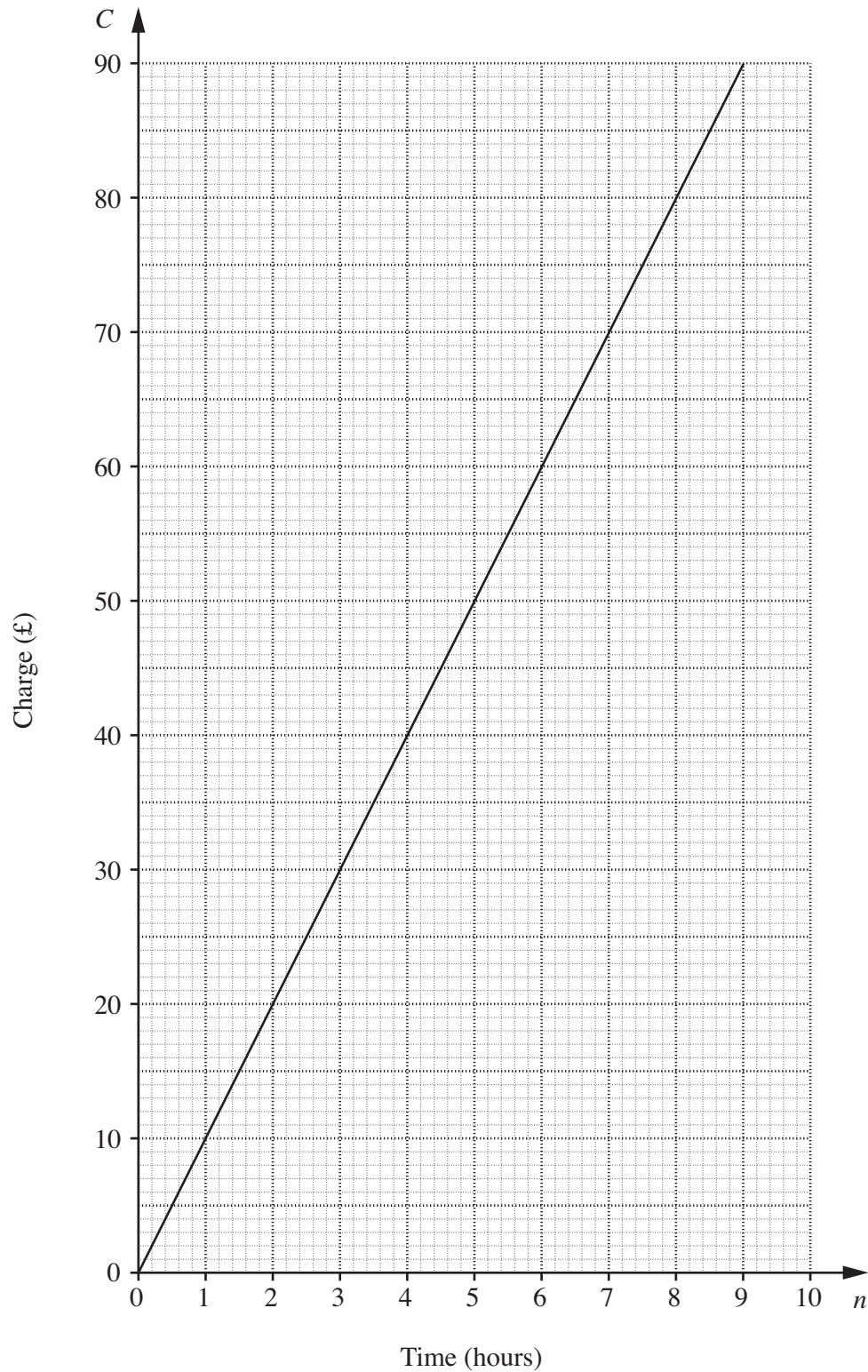
(b) A cuboid measures 2.8 cm by 5.9 cm by 5.1 cm.

Estimate the volume of the cuboid.
Show the estimates you use.
Give the units of your answer.

(b) [3]

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?

(a) £..... [1]

(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*.

n	1	5	10
C			

[1]

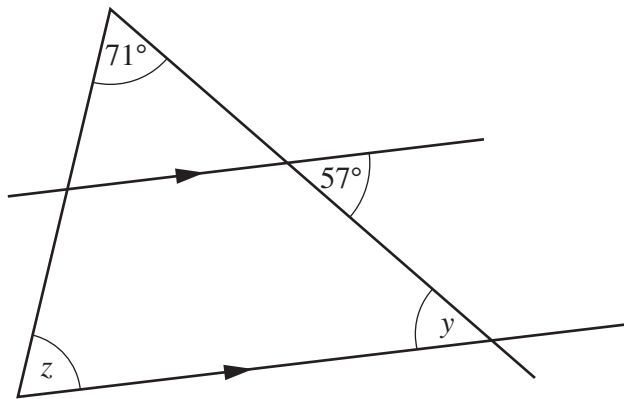
(ii) Draw the graph of the charges of *SpickandSpan* on the same grid as those for *Cleanit!*. [2]

(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?

(c) by £ [2]

3



Not to scale

Find angles y and z , giving your reasons.

$y = \dots\dots\dots^\circ$ because
 [2]

$z = \dots\dots\dots^\circ$ because
 [2]

- 4 Work these out.
Give your answers as fractions in their lowest terms.

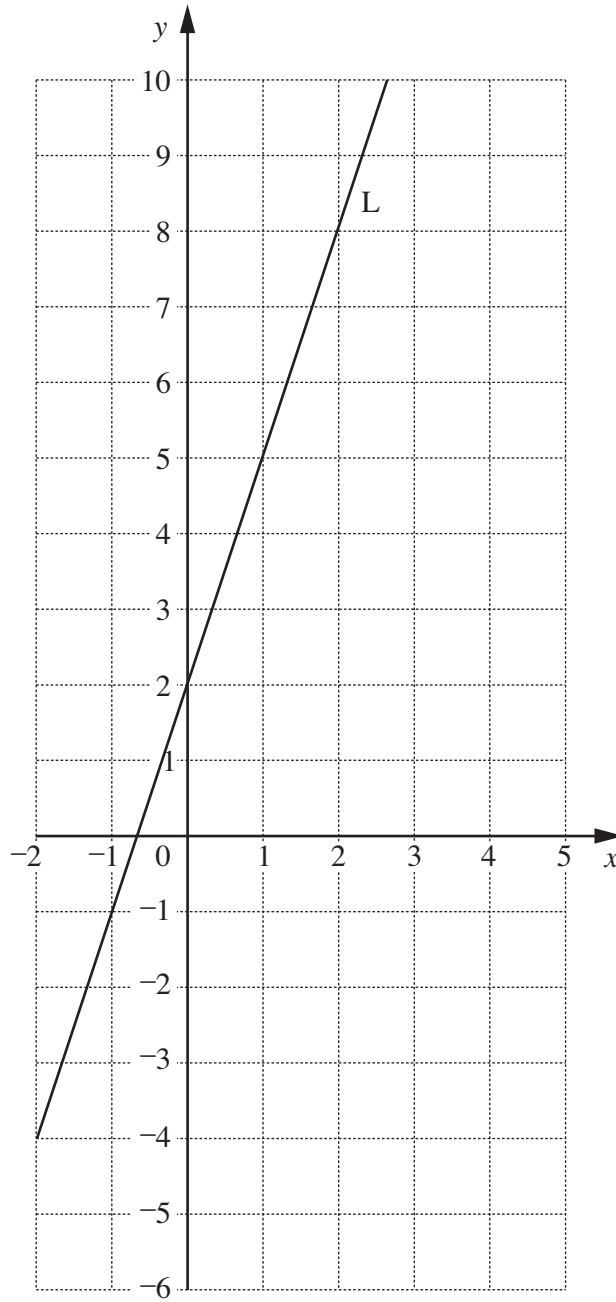
(a) $\frac{3}{5} + \frac{1}{3}$

(a) [2]

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

(b) [3]

5



(a) Find the gradient of line L.

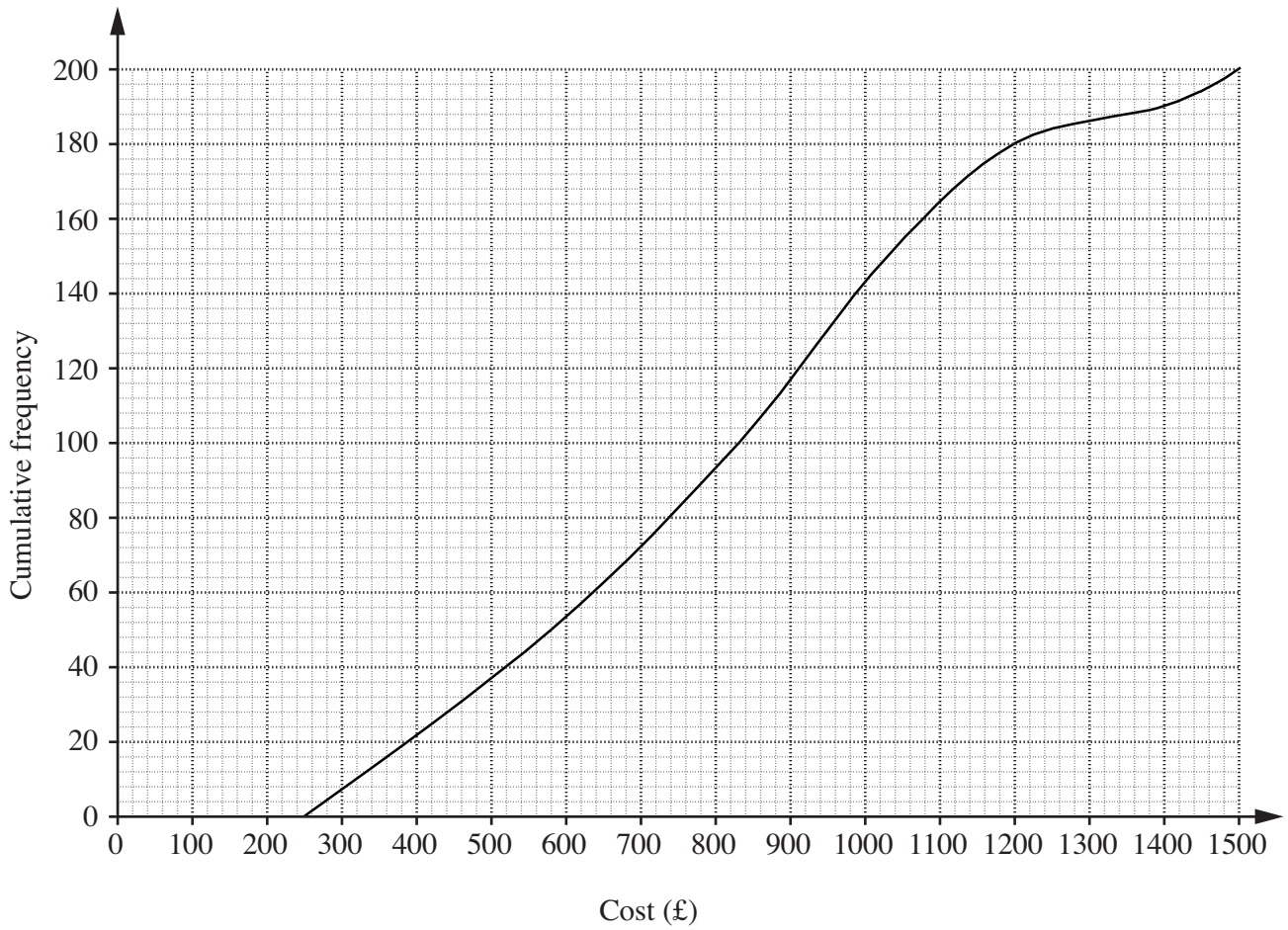
(a) [2]

(b) Find the equation of line L.

(b) [2]

Turn over

- 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?

(a) [1]

- (b) Find the median cost.

(b) £ [1]

- (c) Find the interquartile range.

(c) £ [2]

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

$$y = x^3 + 5$$

(a) [2]

(b) Simplify.

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

(b) [2]

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

$$y = x^2 + 5$$

$$y = 5^x$$

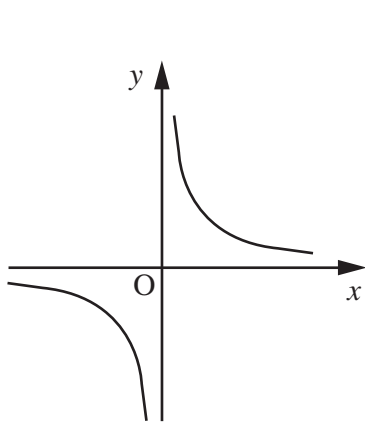
$$y = x^3 + 5$$

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

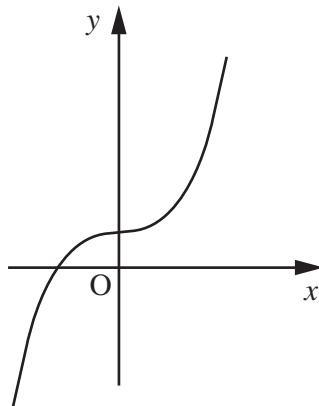
$$y = \frac{1}{x} + 5$$

$$y = 5x^2$$

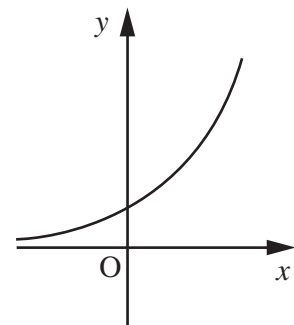
Write the correct equation under each graph.



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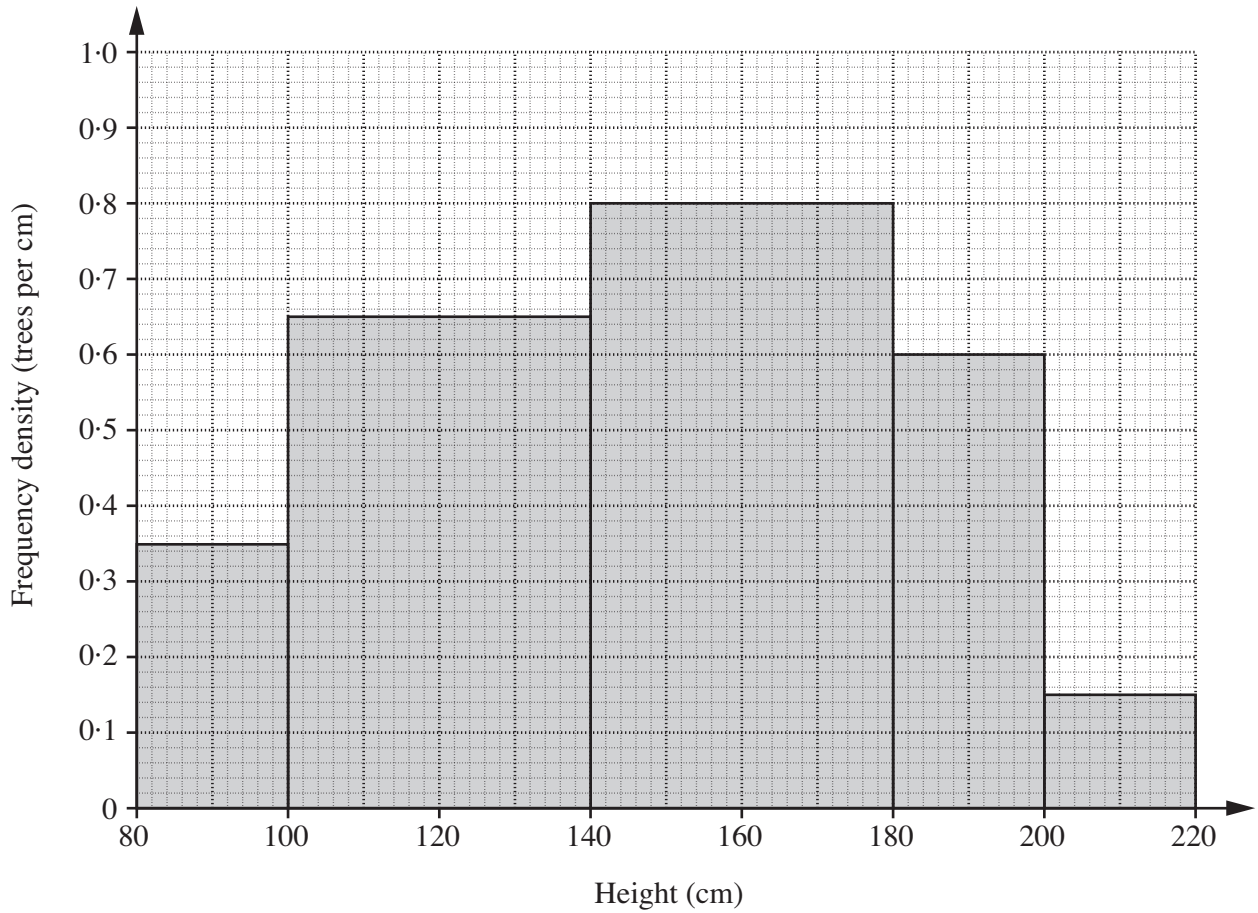
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[3]

- 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.



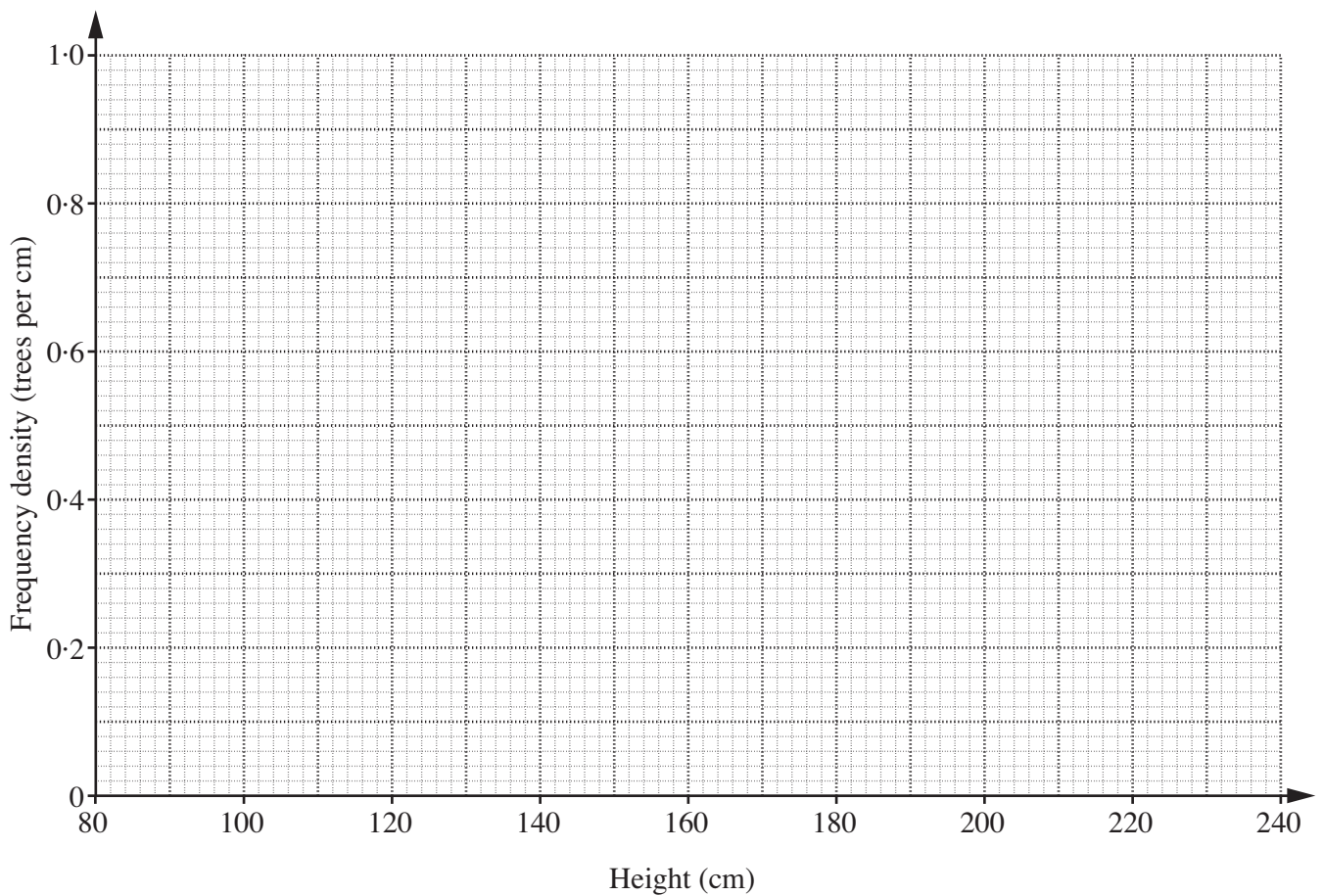
- (a) How many of these birch trees had height 180 to 200 cm two years after planting?

(a) [1]

(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]

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

.....

..... [1]

TURN OVER FOR QUESTION 9

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

(a) [3]

(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.

(b) [2]

(c) Simplify.

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

(c) [2]

(d) Evaluate.

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

(d) [2]

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