Centre Number	Candidate Number	Candidate Name

NAMIBIA SENIOR SECONDARY CERTIFICATE

MATHEMATICS HIGHER LEVEL

8323/1

PAPER 1

2 hours

Marks 80

2019

Additional Materials: Geometrical instruments
Non programmable calculator

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Candidates answer on the Question Paper in the spaces provided.
- Write your Centre Number, Candidate Number and Name in the spaces at the top of this page.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams or graphs.
- Do not use correction fluid.
- Do not write in the margin *For Examiner's Use*.

- Answer **all** questions.

- If working is needed for any question it must be shown below, or where working is indicated.
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Non-programmable calculators may be used.
- If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to **three** significant figures. Give answers for angle sizes to **one** decimal place.
- For π, either use your calculator value, or use 3.142.

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Marker	
Checker	

This document consists of **16** printed pages.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

1 Robert drives 1 763 km from Windhoek to Johannesburg.
Write this distance

(a) correct to the nearest 5 km,

Answer **(a)** .....km [1]

(b) correct to the nearest 100 km.

Answer **(b)** .....km [1]

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2 A computer does 550 000 000 operations each second.

A task performs 6.765×10^{11} operations.
Find, in minutes and seconds, how long the computer takes to complete the task.

Answer .....min .....s [2]

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3 The mass of the Earth is $\frac{1}{95}$ of the mass of planet Saturn.

The mass of the Earth is 5.97×10^{24} kg.

Calculate the mass of planet Saturn, giving your answer, in standard form, correct to 2 significant figures.

Answer ..... [2]

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4 Simplify $\dfrac{q^2 + q^2}{q^{\frac{1}{4}} \times q^{\frac{1}{4}}}$.

Answer ..... [2]

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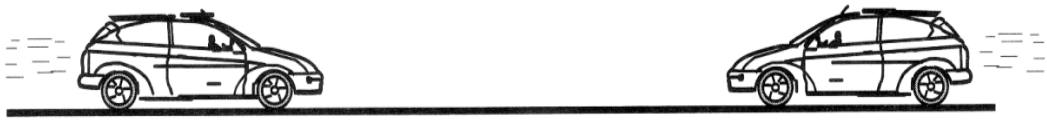
5 The braking distance, d metres, for a driver with normal reactions is given by the equation $d = 0.0053x^2$, where x is the speed in kilometres per hour.

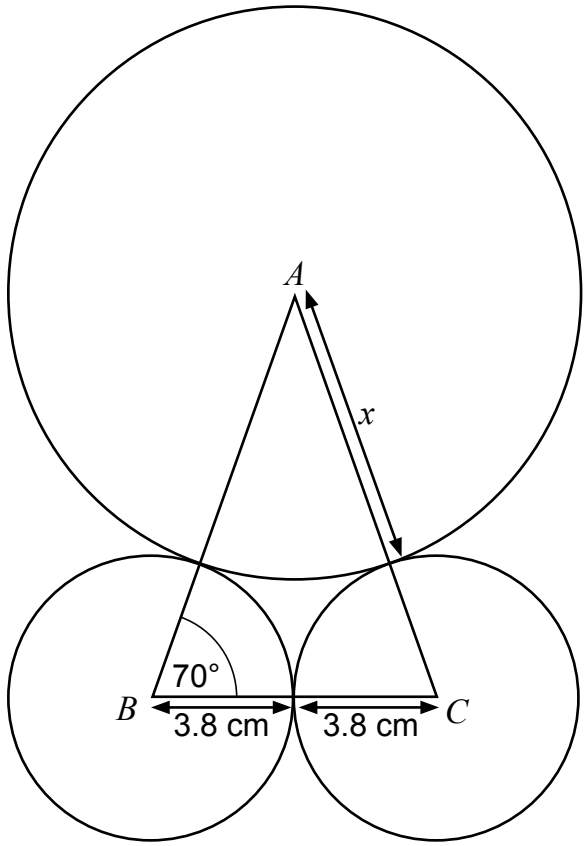


Two cars are heading towards each other.
One car is travelling at 60 km/h and the other at 40 km/h.
The two drivers brake simultaneously.

Determine the shortest distance (to the nearest metre) that the two cars need to be apart to just avoid colliding.

Answer ..... m [3]

6 The diagram shows three touching circles.



NOT TO SCALE

A is the centre of a circle of radius x centimetres.

B and C are the centres of circles, each of radius 3.8 centimetres. Angle ABC = 70°.

Find the value of x.

Answer: x =.....cm [3]

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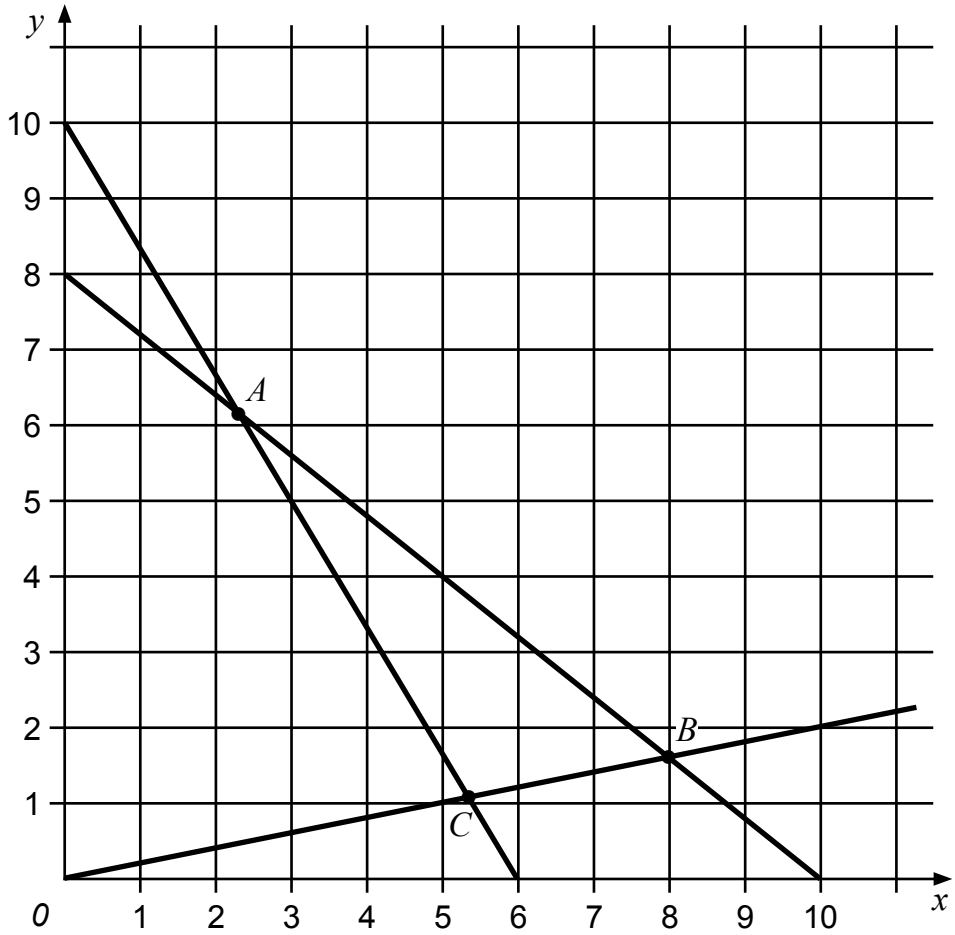
7 Given that (p,q) is a point inside the triangle ABC and that p and q are both integers.



Write down

(a) the largest possible value of p,

Answer **(a)** ..... [1]

(b) the least possible value of $p + q$,

Answer **(b)** ..... [1]

(c) the largest value of $4p + 5q$.

Answer **(c)** ..... [2]

8 The table shows the probabilities of people in Khomas Region being in blood group **O** or in blood group **A** or in blood group **B** or in blood group **AB**.

blood group	probability
O	0.44
A	0.42
B	
AB	0.04

All people in Khomas Region are in exactly one of the blood groups **O**, **A**, **B** or **AB**.

A person is selected at random from the people of the Khomas Region.

(a) Find the probability that this person is in blood group **B**.

Answer **(a)** ..... [1]

(b) Find the probability that this person is in blood group **O** or **A**.

Answer **(b)**..... [1]

(c) There are 1 200 students in a secondary school in the Khomas Region.

(i) Work out an estimate for the number of pupils in the secondary school who are in blood group **AB**.

Answer **(c) (i)**..... [1]

(ii) If two students are chosen at random, find the probability that they are both in the blood group **AB**?

Answer **(c) (ii)**..... [2]

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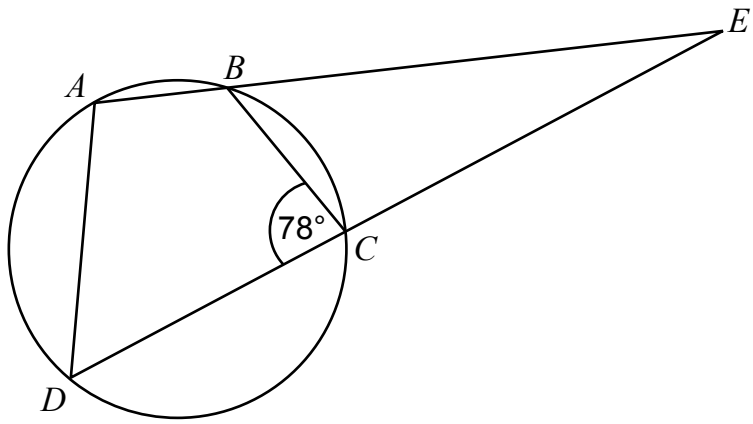
9 A, B, C and D lie on a circle and angle BCD = 78°.



NOT TO SCALE

AB and DC are extended such that they meet at E.

(a) Calculate the angle BAD.

Answer **(a)** angle BAD = ... ° [1]

(b) Show that triangles ADE and CBE are similar.

Answer **(b)**

[3]

(c) It is given that AD = 6 cm, BC = 4 cm and the area of triangle BCE = 12 cm^2.

Calculate the area of quadrilateral $ABCD$.

Answer **(c)** ..... cm^2 [3]

10 Paula bought a car on the 1st January 2015.

By 1st January 2016 the value of the car had reduced by 15%.

The value of the car on 1st January 2016 was N$ 37 400.

(a) Find how much Paula paid for the car.

Answer **(a)** N$ ..... [2]

(b) The value of the car reduces by 15% every year from 2016.

Find the year in which the value of the car will first be below 25% of the price Paula paid in 2015.

Answer **(b)**..... [5]

11

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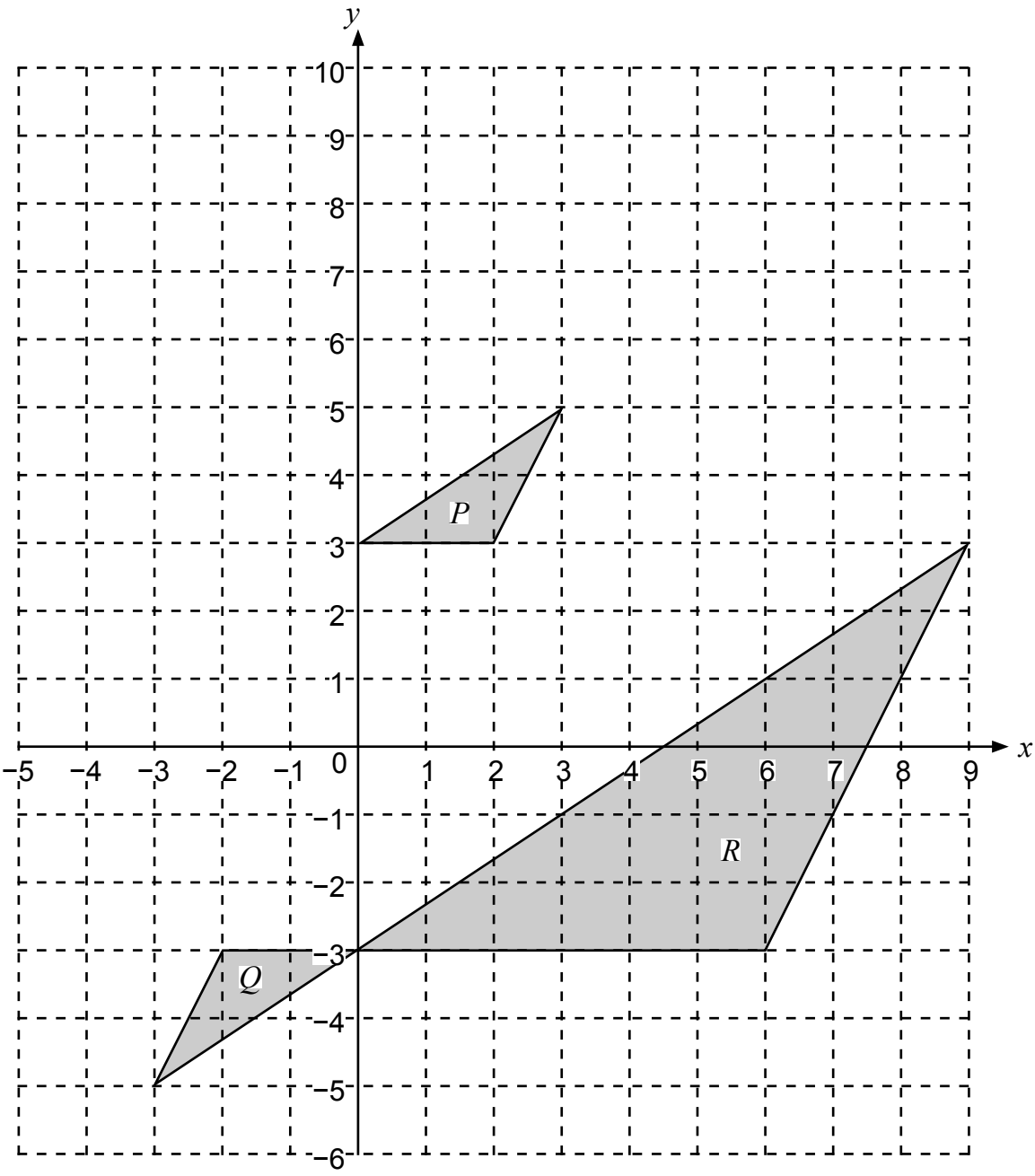

(a) Describe fully

(i) the single transformation which maps triangle P onto triangle Q,

.....

..... [3]

(ii) the single transformation which maps triangle Q onto triangle R.

.....

..... [3]

(b) On the grid, draw the image of triangle P after a reflection in the line $x + y = 8$. [2]

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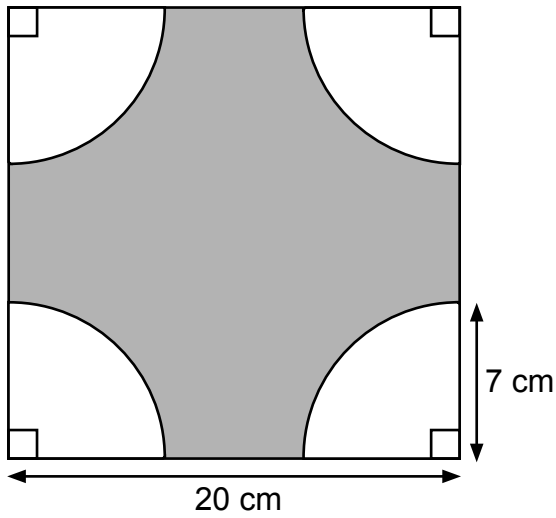
12 The diagram shows a square with sides of length 20 centimetres.

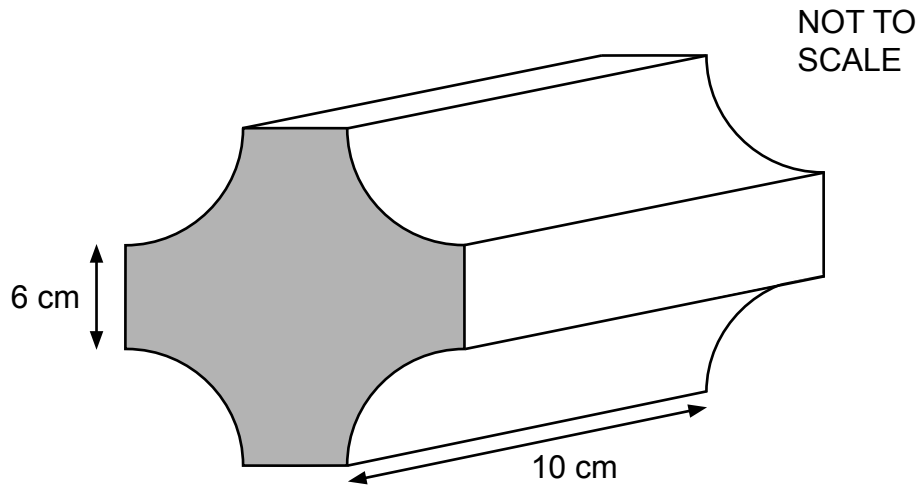


Four quarter-circles, each of radius 7 centimetres, are not shaded.

(a) Calculate the area of the shaded region.

Answer **(a)** ..... cm^2 [2]

(b) The shaded region in **part (a)** is the cross-section of a prism of length 10 centimetres.



(i) Calculate the volume of the prism.

Answer **(b) (i)** ..... cm^3 [1]

(ii) Calculate the total surface area of the prism.

Answer **(b) (ii)** ..... cm^2 [4]

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13 The points (2,5), (3,3) and (k,1) all lie in a straight line.

(a) Find the value of k.

Answer **(a)** k = ... [1]

(b) Find the equation of the line.

Answer **(b)**..... [3]

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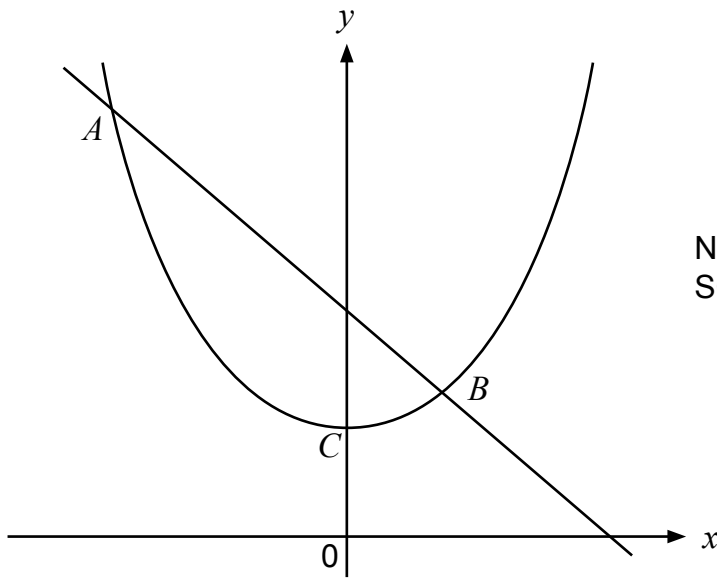
14 The diagram shows a sketch of $y = x^2 + 1$ and the line $y = 4 - x$.



NOT TO SCALE

(a) The curve and the line intersect at A and B.

Show that the x-coordinates of A and B satisfy the equation $x^2 + x - 3 = 0$.

Answer **(a)**

[1]

(b) Using the method of completing the square, solve the equation $x^2 + x - 3 = 0$, giving your answers correct to 2 decimal places.

Answer **(b)** x = ... or x = ... [4]

(c) Find the co-ordinates of the mid-point of the straight line AB.

Answer **(c)** ..... [3]

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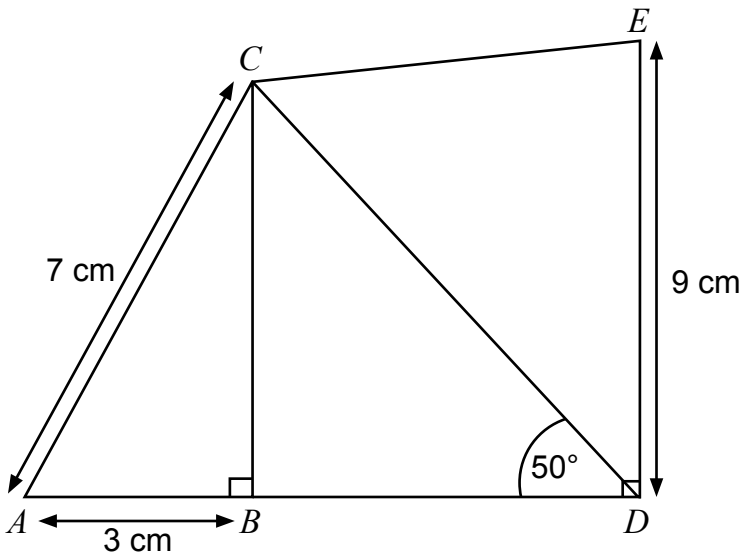
(d) Write down the range of values of x for which the gradient of the graph $y = x^2 + 1$ is negative.

Answer **(d)** ..... [1]

15 In the diagram it is given that AC = 7 cm, AB = 3 cm and DE = 9 cm.



NOT TO SCALE

It is also given that angle ABC = angle BDE = 90° and angle BDC = 50°.

(a) Find the length of CD.

Answer **(a)** .....cm [4]

(b) Find the length of CE.

Answer **(b)** .....cm [3]

(c) Find the area of triangle CDE.

Answer **(c)** ..... cm^2 [2]

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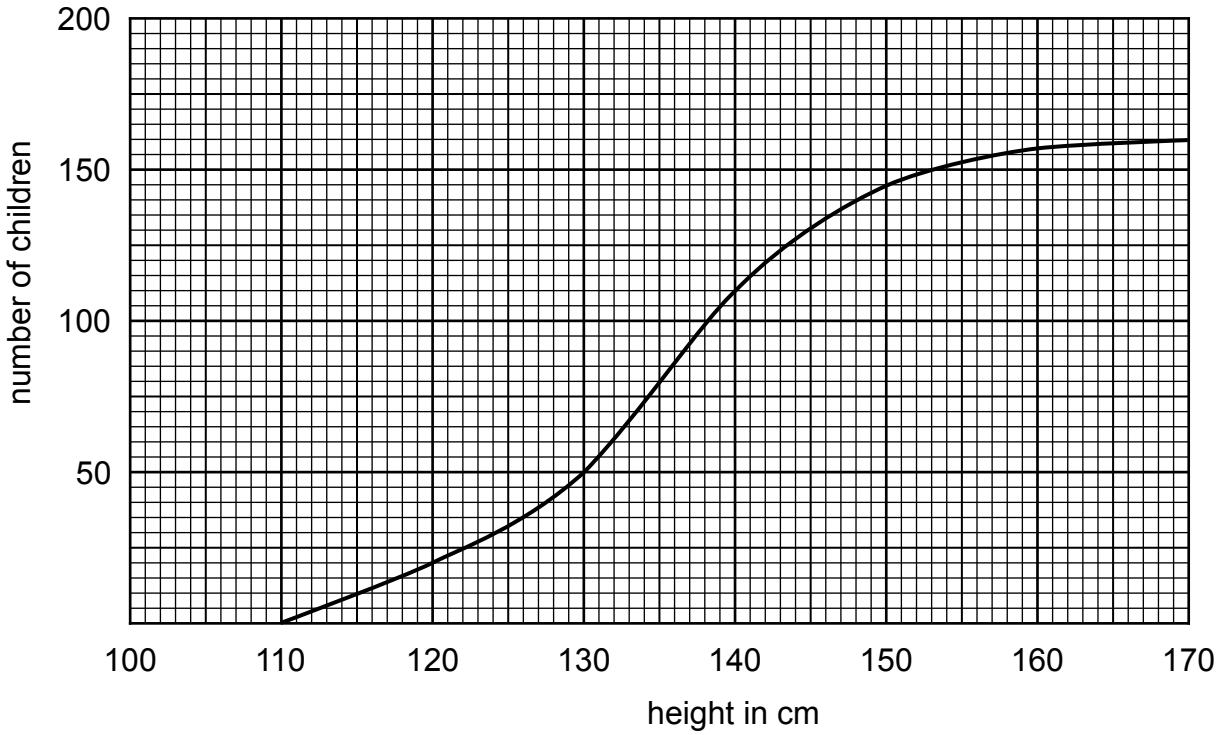
16 The graph shows the cumulative frequency curve of the heights of a sample of 160 children from a school.



(a) Use the graph to find an estimate for

(i) the number of children whose height is more than 150 cm,

Answer **(a) (i)** ..... [1]

(ii) the median height.

Answer **(a) (ii)** .....cm [1]

(b) The shortest 25% of the children are classed as "short".

The tallest 25% of the children are classed as "tall".

The remaining children are classed as "medium".

Find an estimate for

(i) the greatest possible difference in height between two children classed as "tall",

Answer **(b) (i)** .....cm [2]

(ii) the least possible difference between the height of a child classed as "short" and the height of a child classed as "tall".

Answer **(b) (ii)** .....cm [2]