Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education

January 2010

Mathematics

Module N3 Paper 2
(With calculator)
Higher Tier

[GMN32]

GMN32

TUESDAY 12 JANUARY

10.30 am – 11.30 am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

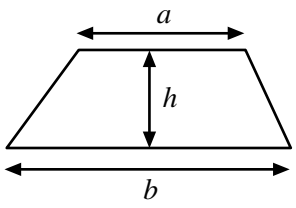
INFORMATION FOR CANDIDATES

The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

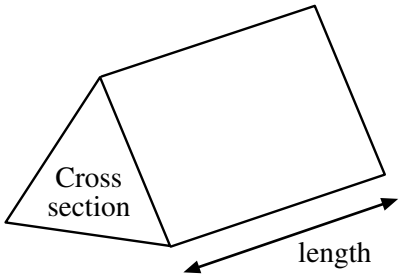
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section × length

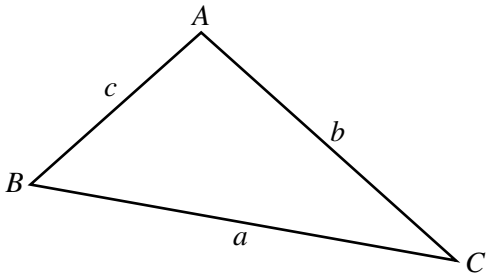


In any triangle *ABC*

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

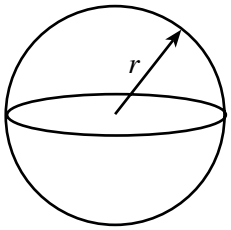
Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



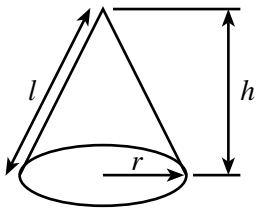
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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



Quadratic equation:

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

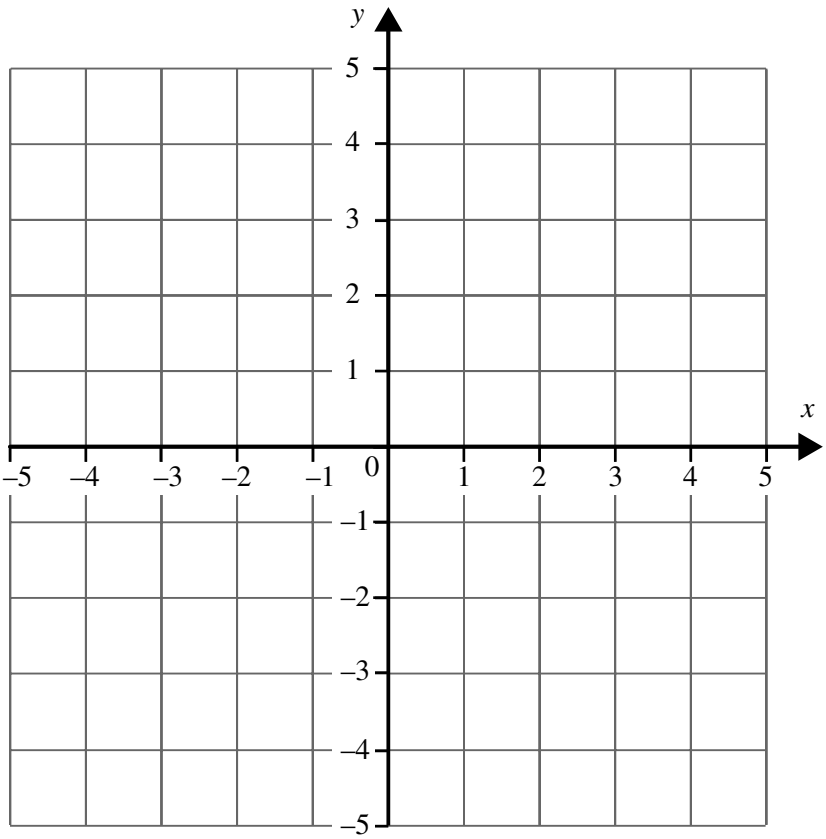
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Examiner Only	
Marks	Remark

1 Calculate $\dfrac{4.3\times 3.9}{7.8-1.9}$ correct to one decimal place.

Answer _____ [2]

2 **(a)** Draw the graph of $y = 2x - 3$ on the grid below.



[3]

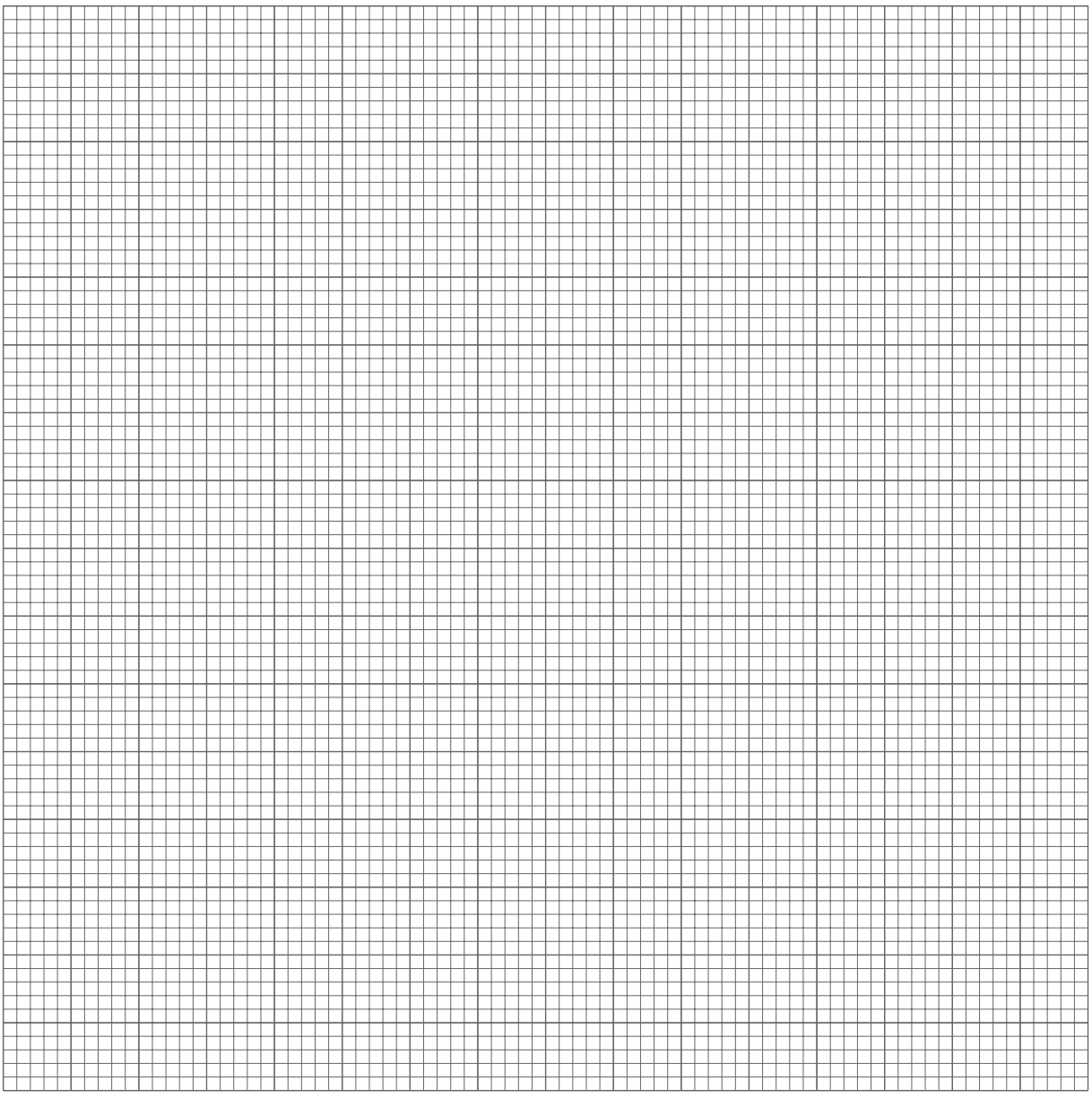
(b) Factorise $6 + 10x$

Answer _____ [1]

3 Penny recorded the play time of each of the tracks on her iPod.
The results are recorded in the table below.

Time (t seconds)	$90 < t \leqslant 120$	$120 < t \leqslant 150$	$150 < t \leqslant 180$	$180 < t \leqslant 210$	$210 < t \leqslant 240$
Frequency	22	35	18	10	6

(a) Show this information on a grouped frequency diagram.



[3]

Examiner Only	
Marks	Remark

(b) What is the modal class interval?

Answer _____ [1]

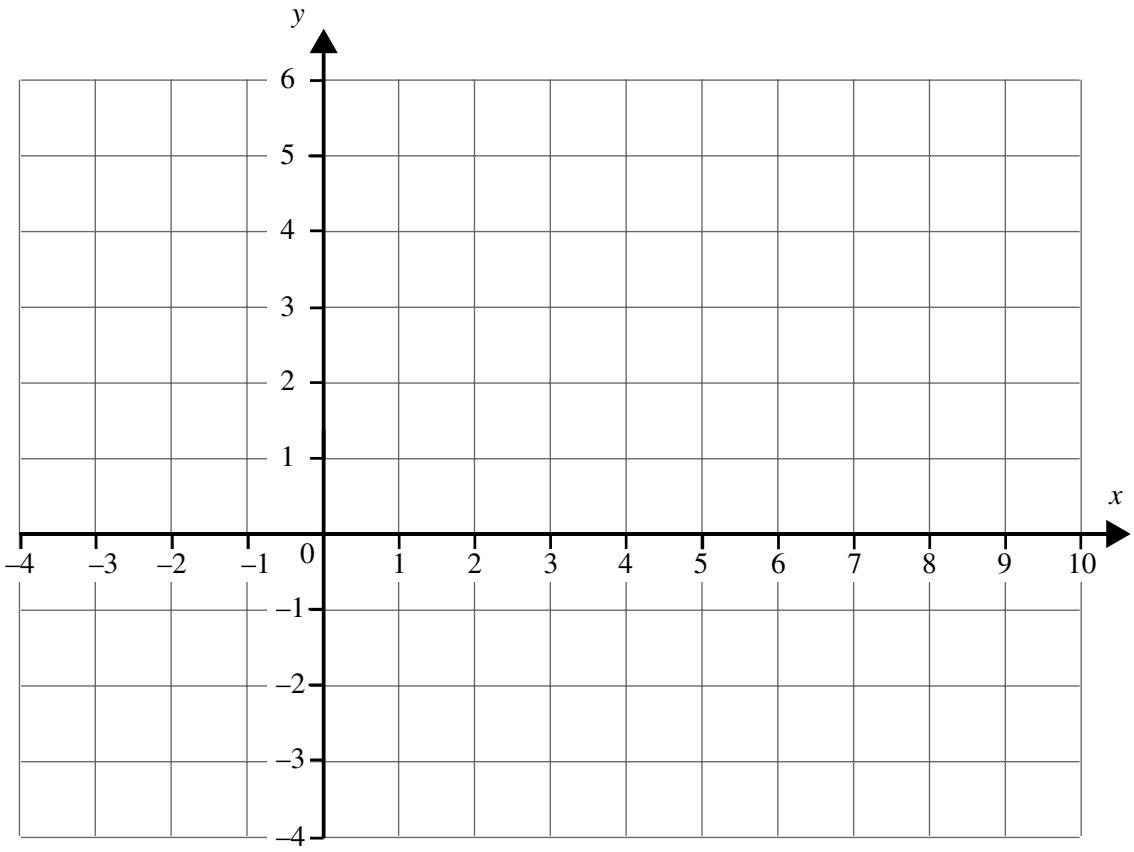
4 **(a)** Change 4.6 m^2 into cm^2.

Examiner Only

Marks	Remark

Answer _____ cm^2 [2]

(b)



G is the point (–2, 4). H is the point (8, –2).
Find the co-ordinates of the midpoint of GH.

Answer (_____ , _____) [2]

5 The lines PQ and RS are parallel.

Write down the size of angles a and b.

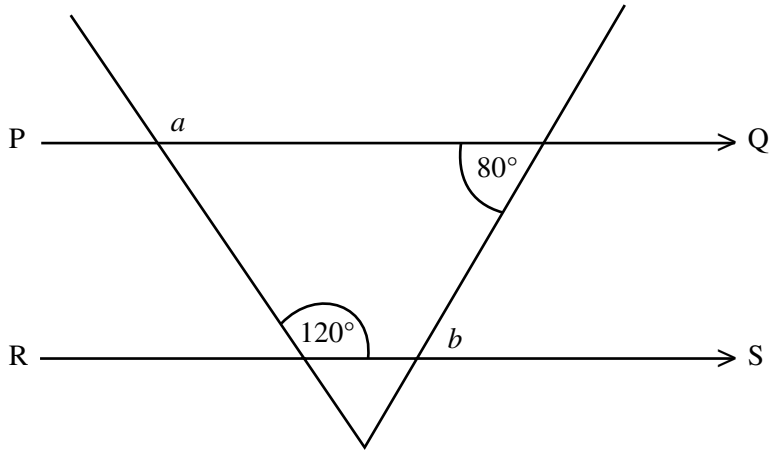


Diagram not drawn accurately

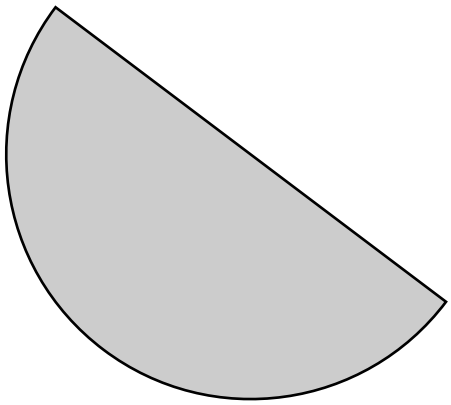
Answer a = _____ °

b = _____ ° [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6



Calculate the perimeter of a semicircle with diameter 8 cm.

Answer _____ [4]

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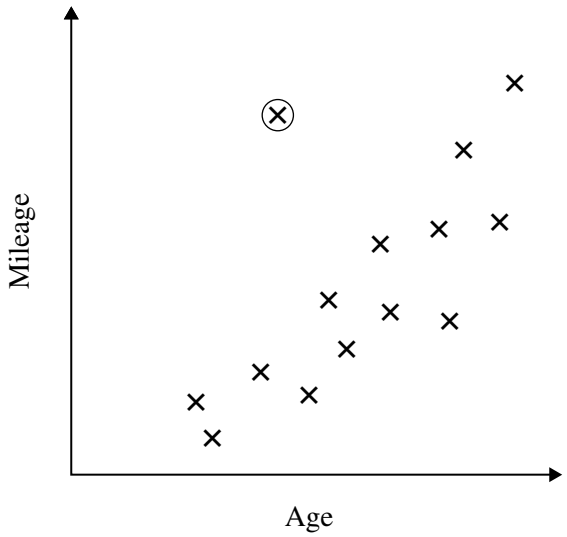
7 In September, Georgina received £600 commission on sales she had made that month.
In October she received 15% less than September.
In November her commission **increased** by 18% and in December by 25% on the previous month.
How much commission did Georgina receive in December?

Show all your working.

Answer £ _____ [3]

Examiner Only	
Marks	Remark

8 **(a)** The scatter graph shows the relationship between the ages of cars and their mileage.



Suggest a reason for the unusual point (circled).

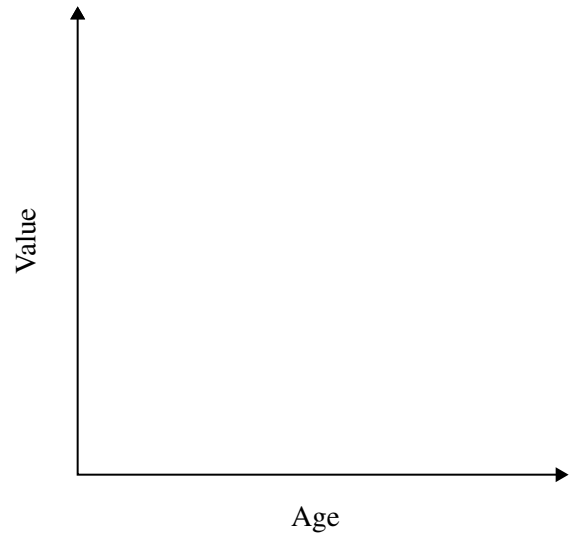
Answer _____

_____ [1]

(b) **(i)** What type of correlation exists between the ages of cars and their value?

Answer _____ [1]

(ii) Sketch a scatter graph with at least six points to illustrate this correlation. [1]



(c) Write down a variable for cars which would have no correlation to the ages of the cars.

Answer _____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 The size of the angles, in degrees, of the triangle below are $2x$, $2x + 19$ and $x + 16$.

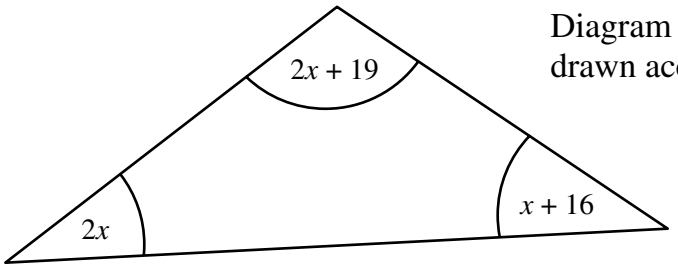


Diagram not drawn accurately

(a) Use the information to write down an equation in terms of x.

Answer _____ [1]

(b) Solve your equation to find the value of x.

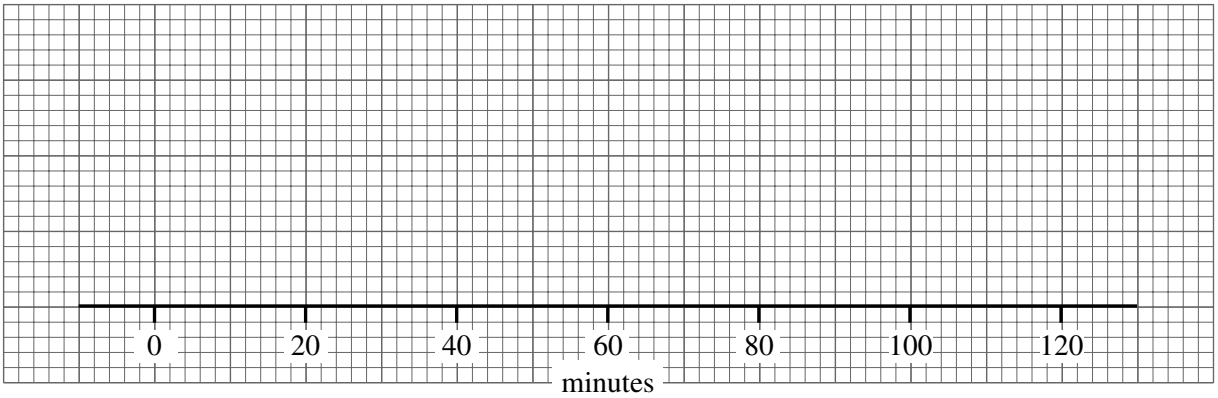
Answer x = _____° [2]

10 A tennis club holds a Junior Tournament.
The time taken to complete each match is recorded.

(a) The statistical data for the girls' matches is:

Minimum time	42 minutes
Maximum time	104 minutes
Lower quartile	68 minutes
Upper quartile	90 minutes
Median time	84 minutes

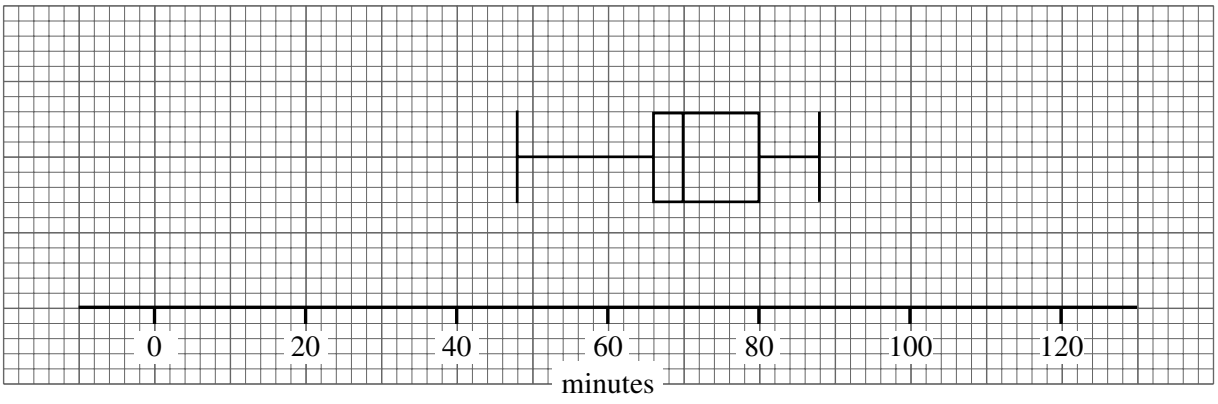
Draw a box plot to illustrate this data.



[2]

Examiner Only	
Marks	Remark

(b) Similar data is recorded for the boys' matches and a box plot drawn.



Give **two** comments on the times taken to complete the girls' matches compared to the times taken to complete the boys' matches.

Examiner Only	
Marks	Remark

_____ [1]

_____ [1]

Examiner Only	
Marks	Remark

11 St Elsewhere High School had an 8% absence rate on a particular day.

If there were 989 pupils present, how many pupils were absent?

Answer _____ [3]

12

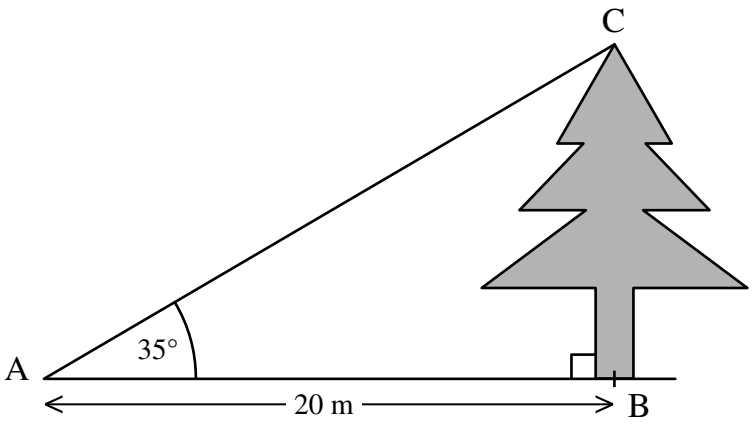


Diagram not drawn accurately

The angle of elevation from A to the top of the tree C is 35°.
The distance AB = 20 m.

Calculate the height BC of the tree.

Answer _____ m [3]

13 **(a)** Expand and simplify $(3x + 5)(4x - 2)$

Examiner Only	
Marks	Remark

Answer _____ [2]

(b) Factorise $x^2 - 3x - 40$

Answer _____ [2]

THIS IS THE END OF THE QUESTION PAPER