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90153

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Mathematics, 2005

90153 Use geometric reasoning to solve problems

Credits: Two
9.30 am Monday 21 November 2005

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

You should show ALL working.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Use geometric reasoning to solve problems. ☐	Use, and state, geometric reasons in solving problems. ☐	Solve an extended geometrical problem. ☐
Overall Level of Performance ☐		

You are advised to spend 25 minutes answering the questions in this booklet.

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ANGLES AROUND US

You should show **ALL** working.

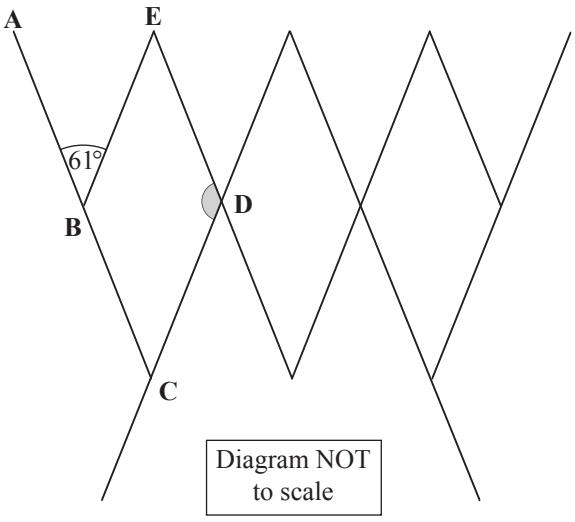

Diagram NOT to scale

QUESTION ONE

The clothes rack is made up of rhombuses.
Angle **ABE** = 61°.

Calculate angle **CDE**.

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QUESTION TWO

A regular hexagonal table and regular octagonal table are pushed together.
ABCDEL is a regular hexagon.
LEFGHIJK is a regular octagon.

Calculate angle **DEF**.

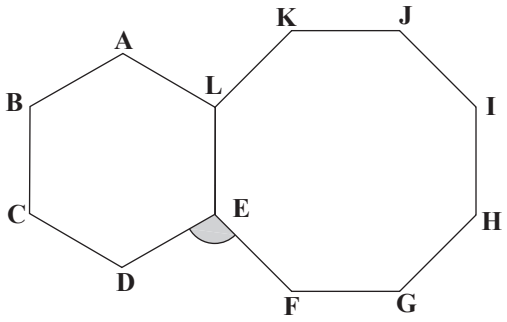

Diagram NOT to scale

QUESTION THREE

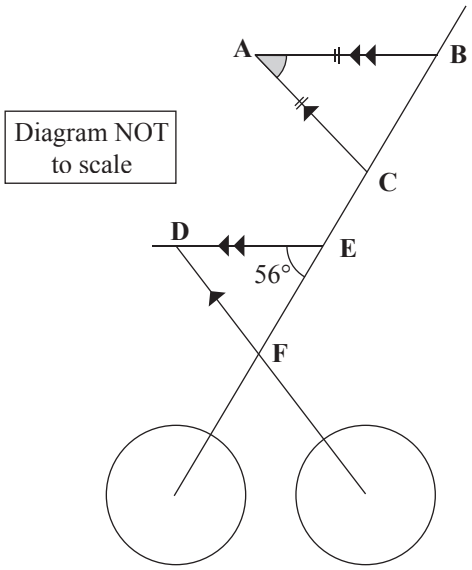

Diagram NOT to scale

AB is parallel to **DE**
DF is parallel to **AC**
AB = **AC**
Angle **DEF** = 56°

Calculate angle **CAB**.

QUESTION FOUR

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The diagram is the cross section of a spherical scoop of ice-cream **AEC** sitting in a cone **ACD**.
DA and **DC** are tangents to the scoop of ice-cream.
The angle at the centre, **ABC**, is 152°.

Calculate angle **ADC**.
You must give a geometric reason for each step leading to your answer.

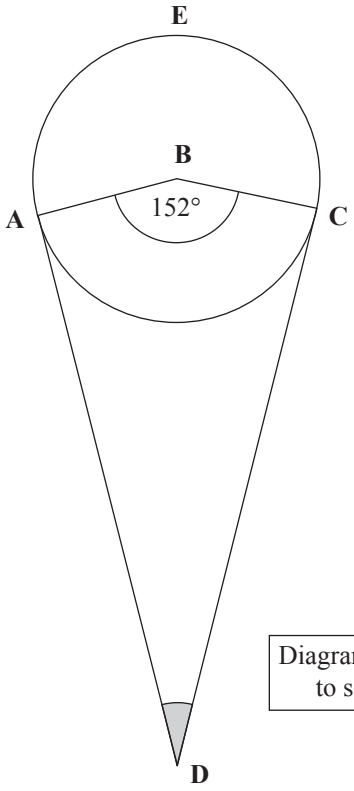

Diagram NOT to scale

QUESTION FIVE

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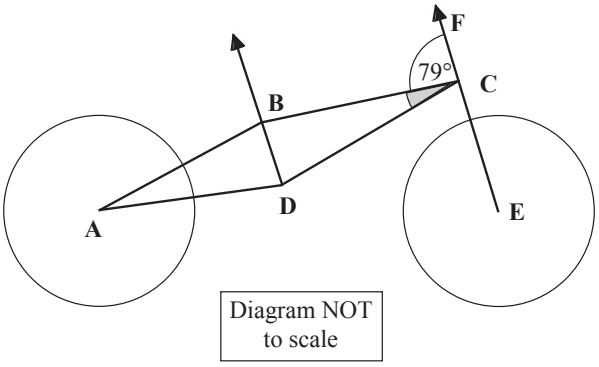

Diagram NOT to scale

ABCD is a kite.
CB = **CD**
EF is parallel to **DB**.
Angle **FCB** = 79°

Calculate angle **BCD**.
You must give a geometric reason for each step leading to your answer.

QUESTION SIX

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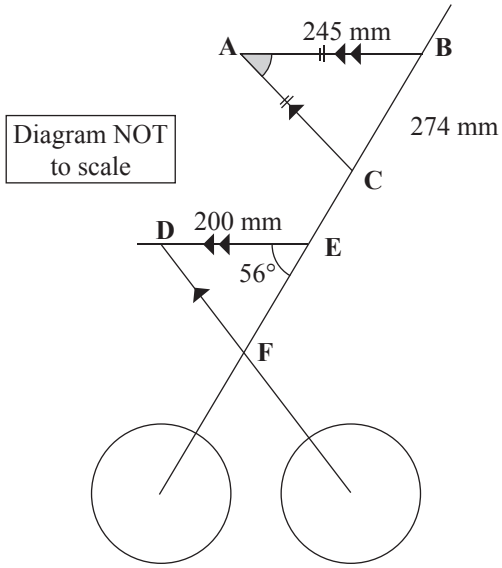

Diagram NOT to scale

AB = 245 mm
BC = 274 mm
DE = 200 mm
AB is parallel to **DE**
DF is parallel to **AC**
AB = **AC**

Calculate the length **EF**.
You must give a geometric reason for each step leading to your answer.

QUESTION SEVEN

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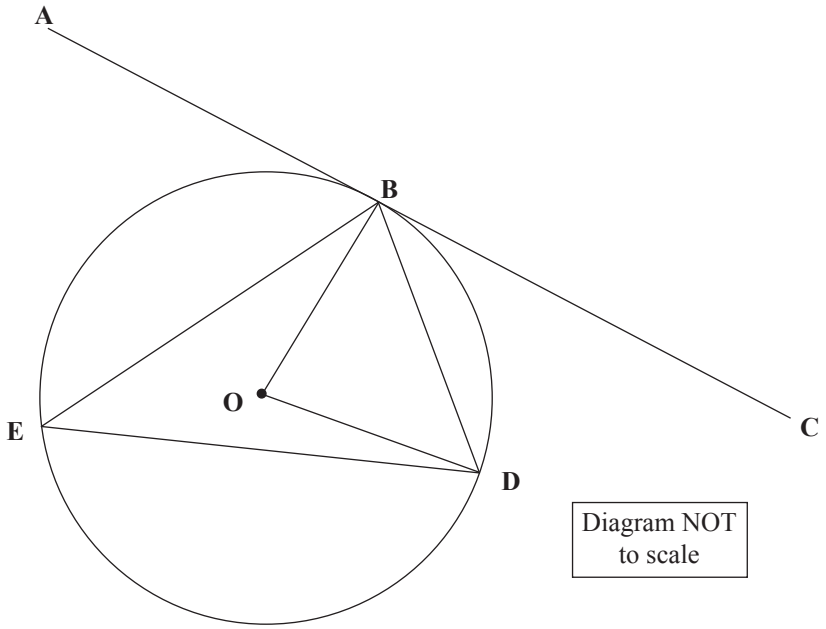
The circle, centre **O**, has a tangent **AC** at point **B**.
The points **E** and **D** lie on the circle.

Prove that ∠**CBD** = ∠**BED**.



Extra paper for continuation of answers if required.
Clearly number the question.

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Question number