For Supervisor's use only

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90152

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

Level 1 Mathematics, 2003

90152 Solve right-angled triangle problems

Credits: Two
2:00 pm Wednesday 19 November 2003

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.

Show ALL working.

If you need more space for any answer, use the pages 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.

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Achievement Criteria		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Find unknowns in right-angled triangles. ☐	Find unknowns in practical situations involving right-angled triangles. ☐	Find unknowns in word or 3D problems. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

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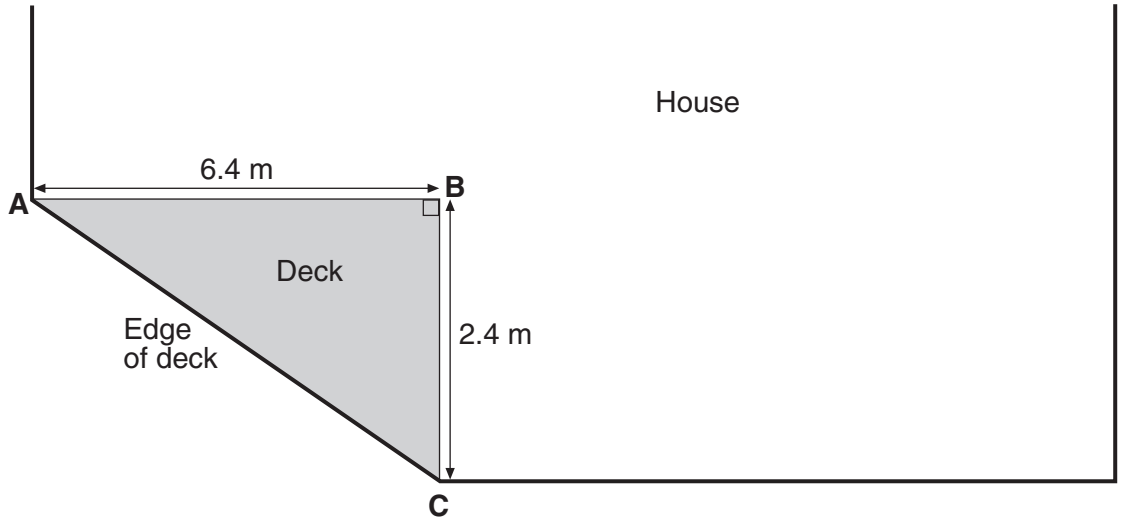
Home and Garden

Show **ALL** working.

QUESTION ONE

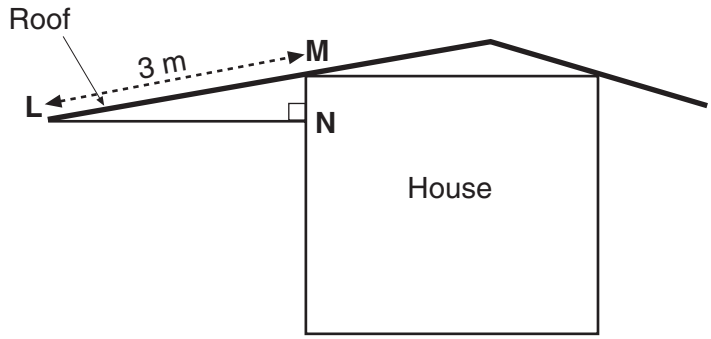
Sophie has put a triangular deck at the front of her house, as shown in the diagram below.



(a) Calculate the length of **AC**, the edge of the deck.

(b) Calculate the angle **BAC**, which the edge of the deck makes with the house.

(c) **LM** is a 3 m extension of the roof of the house out over the deck.
The roof makes an angle **LMN** = 63° with the wall of the house.



Calculate the length **LN**, the distance of the edge of the roof from the house.

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QUESTION TWO

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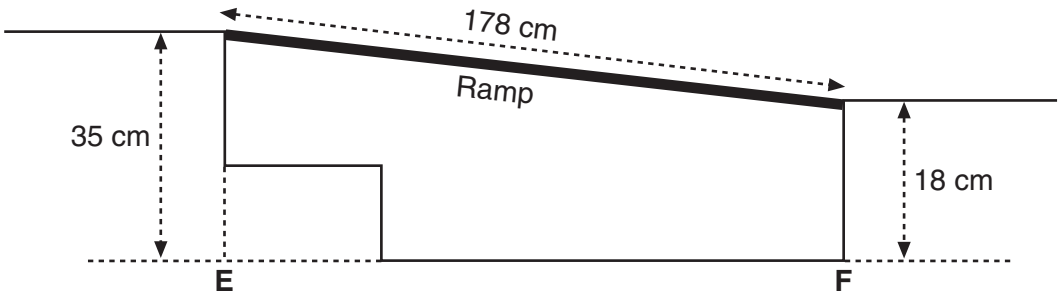
Sophie wants to alter a path at the back of the house.
At the moment, there are 2 steps down and 1 step up.
Sophie has decided to put a ramp straight across, as shown in the diagram below.
The new ramp will be 178 cm long.
The local council regulations state that the maximum angle that the ramp can make with the horizontal is 5°.



(Not to scale)

(a) Will the ramp meet the council regulations?
Show your working.

(b) Calculate **EF**, the horizontal distance between the edges of the two steps.

QUESTION THREE

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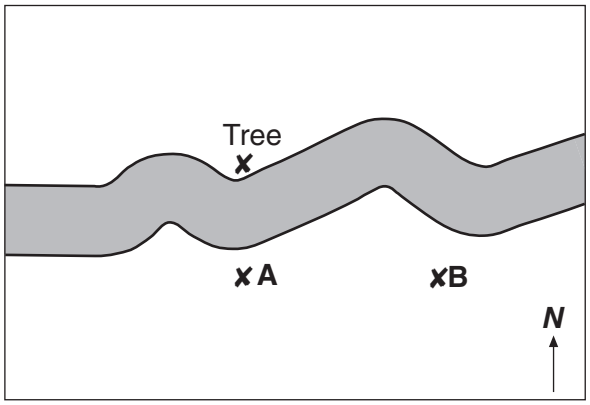
A small stream goes across the back of Sophie's section.

There is a tree on the bank on the far side of the stream.
The tree is due north of a point marked **A**.
Sophie wants to make a rope bridge that will go across the stream from **A** to the tree.
She has a 3 m long piece of rope.
She wants to know if her rope is long enough for the rope bridge.



Sophie puts a marker at **B**.
B is 4 m due east of **A**.
The tree has a bearing of 303° from **B**.

Is the rope long enough to make the bridge?
Show your working.

QUESTION FOUR

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Sophie has been given a kitset for a shade house. A leaflet shows how the poles are assembled. There are 3 diagrams on the leaflet, as shown below.

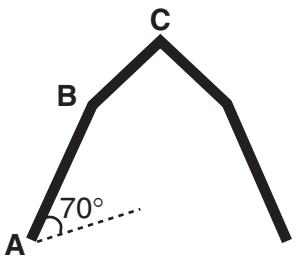

Diagram 1
End view

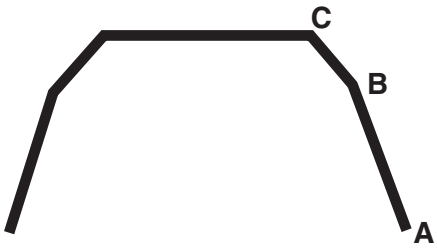

Diagram 2
Side view

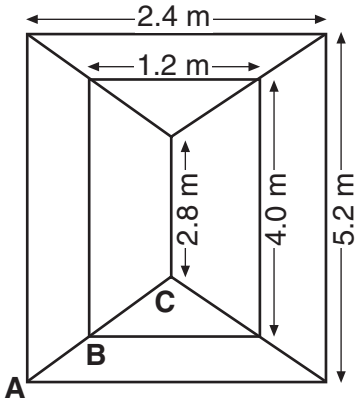

Diagram 3
Top view

The leaflet also gives the following information:
– the angle **AB** makes with the ground is 70°
– the angle between the poles **AB** and **BC** is 164°.

Before Sophie assembles the shade house, she wants to know its height.
Calculate the height of the shade house.

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

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Question Number

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Clearly number the question.

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