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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Mathematics, 2007

90152 Solve right-angled triangle problems

Credits: Two
9.30 am Tuesday 20 November 2007

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 2–6 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**
Solve right-angled triangle problems. ☐	Solve problems in practical situations involving right-angled triangles. ☐	Solve problems in word or 3D situations. ☐
Overall Level of Performance ☐		

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

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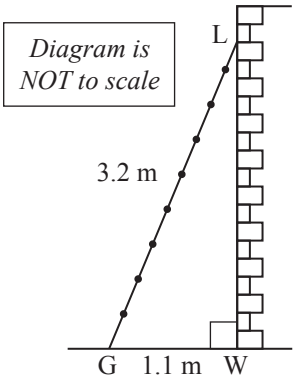
QUESTION ONE

A 3.2 m ladder, LG, is leaning against a wall as shown in the diagram.
The foot of the ladder is 1.1 m from the wall.



Calculate WL, the distance the ladder reaches up the wall.

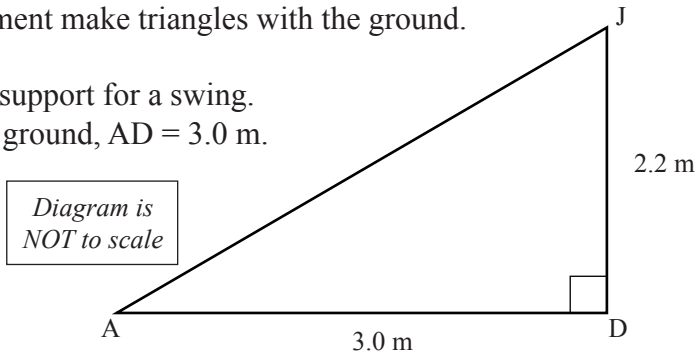
WL = _____ m

QUESTION TWO

At the playground, many pieces of equipment make triangles with the ground.

(a) The triangle AJD shows part of the support for a swing.
DJ = 2.2 m, and the distance on the ground, AD = 3.0 m.

Calculate the length of AJ.



AJ = _____ m

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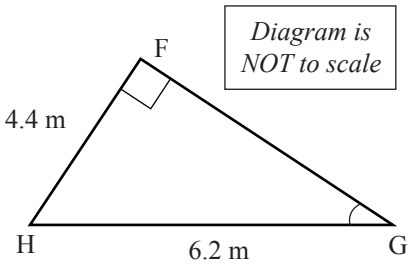
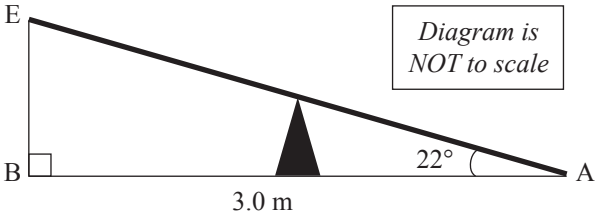
(b) The triangle FGH is part of the frame for a climbing net.
HF = 4.4 m
The distance on the ground HG = 6.2 m.



Calculate the angle between FG and the ground, the angle FGH.

Angle FGH = _____ °

(c) This diagram shows a see-saw EA.
BA = 3.0 m.
The angle between the see-saw and the ground, angle BAE = 22°.



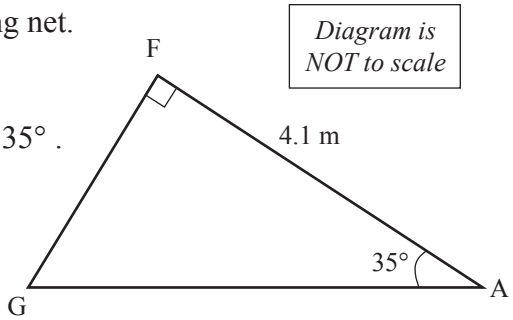
Calculate EB, the height of E above the ground.

EB = _____ m

(d) This diagram shows one end of a frame for a climbing net.

FA = 4.1 m.
The angle between FA and the ground, angle GAF = 35° .

Calculate GA, the distance along the ground.



GA = _____ m

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QUESTION THREE

The Parthenon is a famous building in Greece.
In the picture of the Parthenon shown on the right, the ratio of the width AB to the height BC is 3.236 : 2.

Calculate the size of angle DCA.

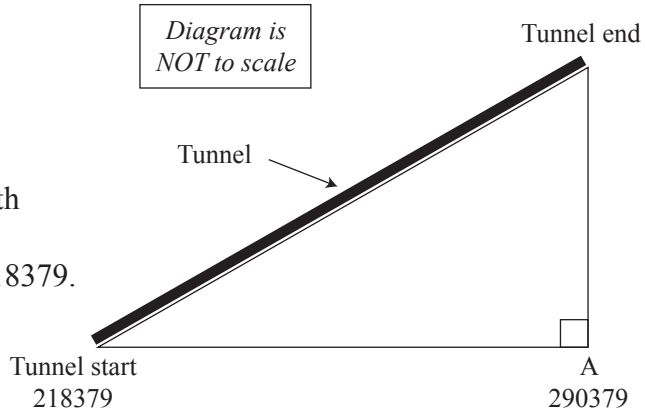
Picture is NOT to scale

Angle DCA = _____ °

QUESTION FOUR

Engineers are constructing a straight tunnel.
They use grid references for positions.
A grid reference of 123456 means the position they are looking at is 123 m East and 456 m North of a fixed point.
The grid reference for the start of the tunnel is 218379.
The grid reference for point A is 290379.
Distances are in metres.
The length of the tunnel is 78 metres.

Diagram is NOT to scale



Determine the grid reference for the end of the tunnel.

Grid reference for the end of the tunnel = _____

QUESTION FIVE

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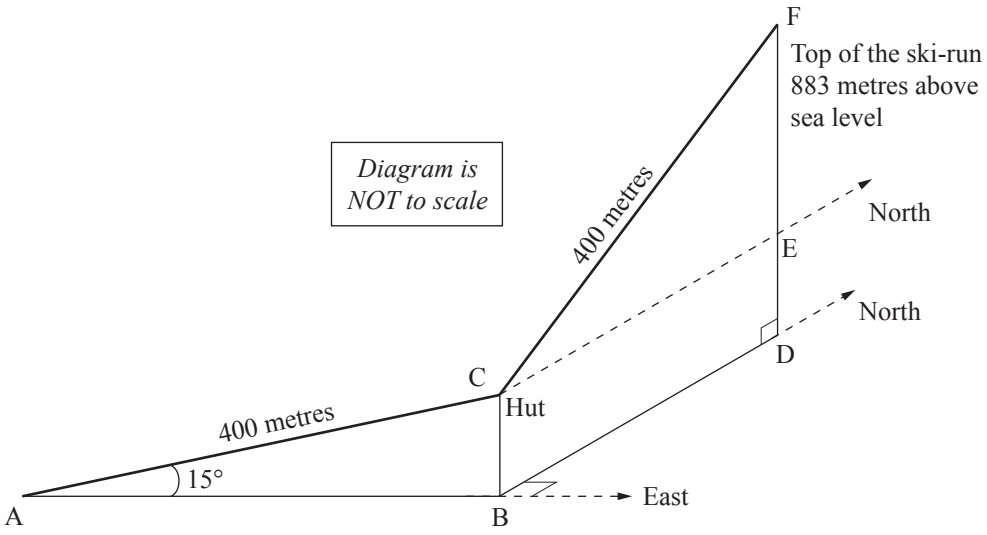
The diagram below shows the position of the Information Centre, A, relative to a hut, C, and the top of the ski-run, F.
The Information Centre is 550 m above sea level.
The start of the ski-run is 883 m above sea level.
The distance AC = CF = 400 m.
The hut, C, is east of the Information Centre, A.
The top of the ski-run, F, is north of the hut, C.
The angle of elevation from the Information Centre to the hut, C, is 15°.
The operators of the chair-lifts are going to buy walkie-talkies to use for communication between the start of the ski-run, F, and the Information Centre, A.
The manufacturer claims that the useful range of the walkie-talkies is for distances of up to 600 metres.



Investigate the usefulness of the walkie-talkies in this situation.
Use correct mathematical statements and make it clear what you are calculating at each step.

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

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Question number	

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