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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Level 1 Mathematics, 2009

90152 Solve right-angled triangle problems

Credits: Two

9.30 am Friday 20 November 2009

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.

The questions in this paper are NOT in order of difficulty. Attempt all questions or you may not provide enough evidence to achieve the required standard.

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

You should show ALL working.

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**	
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			

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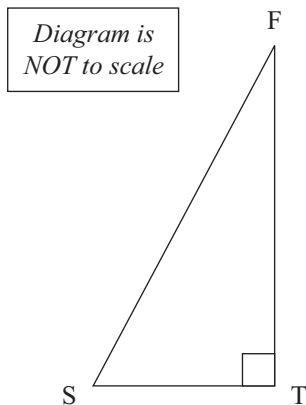You are advised to spend 30 minutes answering the questions in this booklet.

QUESTION ONE

There is an orienteering course in the Waipoua State Forest near the large kauri tree, Tane Mahuta, T.

(a)   Sam stands at S, 5 m away from Tane Mahuta, T.
FT, the height of the first branch is 9 m.

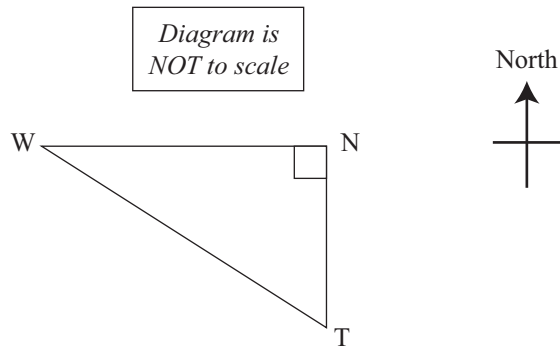Calculate the length of SF, the distance of Sam from the first branch.

Diagram is NOT to scale

F

S   T

SF = _____ m

(b) Sam runs 125 metres North from Tane Mahuta, point T, to point N.
Then he runs West until he reaches the point W. He is then 325 metres from T.

$\boxed{\textit{Diagram is}\\\textit{NOT to scale}}$

North

W ———— N

T

(i) Calculate the distance Sam runs to the West, WN.

_____

_____

_____

_____

_____

Distance WN = _____ m

(ii) Sam is still at the point W.

Calculate the **bearing** of Tane Mahuta, T, from Sam.

_____

_____

_____

_____

_____

Bearing : _____ °

(c) Sam rests at point W, while Rangi starts from Tane Mahuta, T, and walks 400 metres South and then 600 metres on a bearing of 250°.

Calculate the distance between Rangi and Sam now.

Show what you are calculating at each step.

Distance : _____ m

QUESTION TWO

(a) The diagram shows a square pyramid, with base ABCD.

Diagrams are NOT to scale
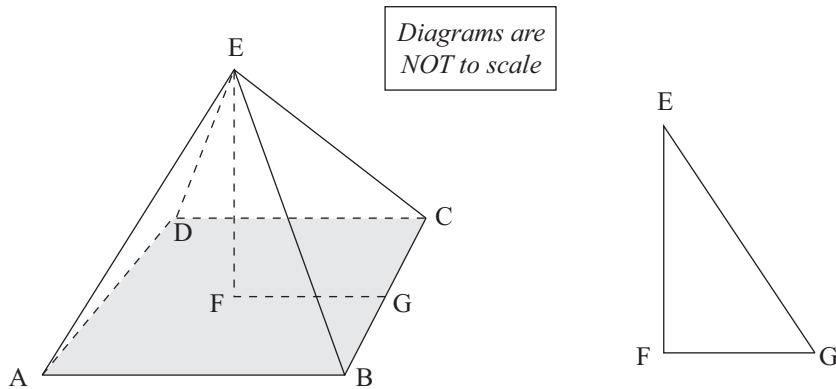
Each side of the base is 220 metres long.

FG = 110 m

The height of the pyramid EF is 140 m.

Calculate the angle EGF.

_____

_____

_____

_____

_____

EGF = _____ °

(b) The Eye in London is a big Ferris wheel mounted so the bottom of the wheel is 1 m above level ground.

The centre of the Eye, E, is 67 metres directly above B, which is at ground level.

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wikimediafoundation.org/ wiki/File:London_Eye,_ London.JPG

(i) There is a support wire from the centre of the Eye, E, to the ground at a point, G.

The angle BEG is 53°.

Calculate the length BG.

_____

_____
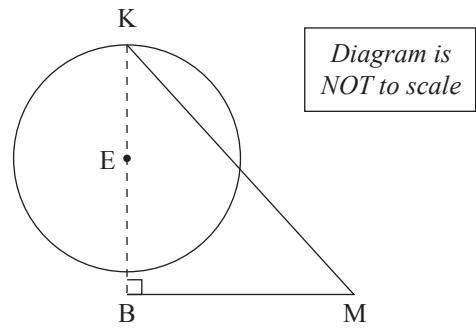
_____

BG = _____ m

Diagram is NOT to scale

(ii) Kim is at the highest point, K, on the Eye.

Kim's mother is standing on the ground at a point M, looking up at Kim.
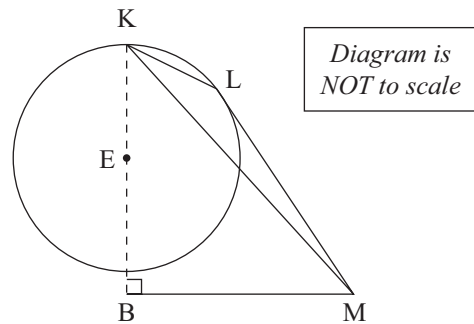
She looks up through an angle of 53°.

Calculate the distance between Kim and her mother, KM.

K

Diagram is NOT to scale

E •

B   M

_____

_____

_____

KM = _____ m

(iii) Kim's brother Lee is in a different seat at L.

The distance from Lee to his mother is 160 metres.

He looks down to his mother through an angle of 55º.

Calculate KL, the distance between Kim and Lee.

K

L

Diagram is NOT to scale

E •

B   M

_____

_____

_____

_____

_____

_____

_____

_____

_____

Distance between Kim and Lee = _____ m

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

Question number

90152