90152

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

Level 1 Mathematics, 2006

90152 Solve right-angled triangle problems

Credits: Two
9.30 am Friday 24 November 2006

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**	
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.

BLOWING IN THE WIND

You should show **ALL** working.

QUESTION ONE

The pupils in Rewa's technology class have made model boats.
The pupils sail them across the school pool.
The pool is 15 metres wide.

(a)   Rewa tries to sail her boat straight across the pool, from point **A**.
The wind blows her boat off-course, 8 metres down the pool.
The diagram shows the path, **AB**, her boat actually sailed.
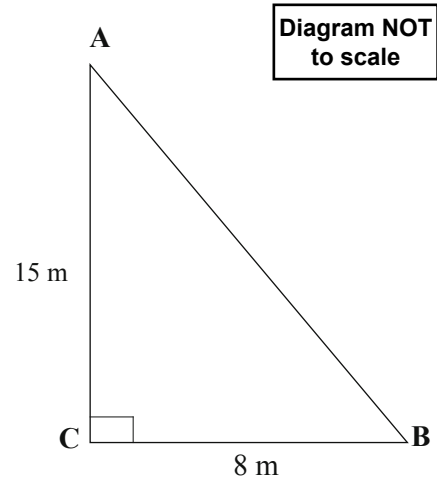
Calculate the distance, **AB**, sailed by Rewa's boat.

Diagram NOT to scale

A

15 m

C

8 m

B

_____

_____

_____

_____

_____

AB = _____ m

(b)   Lee also tries to sail his boat straight across the pool, from point **F**.
His boat travels a distance of 20 metres.

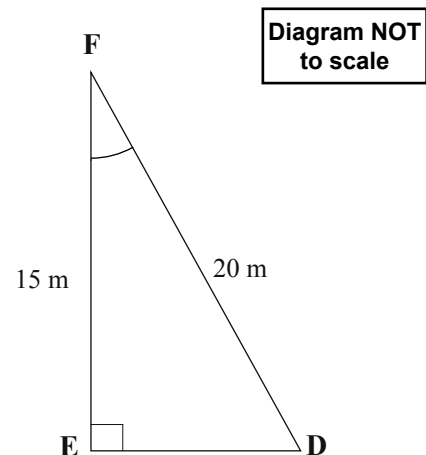Calculate the distance, **ED**, that Lee's boat is blown off-course down the pool.

Diagram NOT to scale

F

15 m

20 m

E

D

_____

_____

_____

_____

_____

ED = _____ m

(c)   Tama's boat sails from point **G** to point **H** at an angle of 31°, as shown in the diagram.
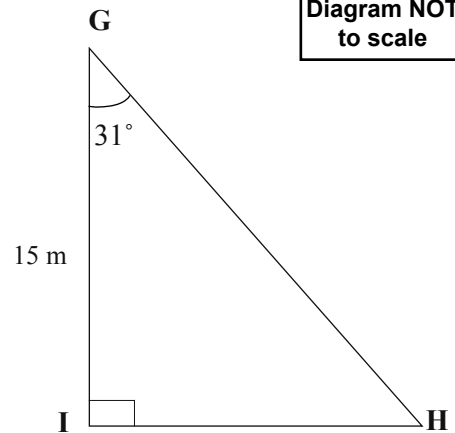
Calculate the distance, **IH**.

_____

_____

_____

_____

_____

_____

IH = _____ m

Diagram NOT to scale

G

31°

15 m

I

H

(d)   Peta's boat sails from point **K**, 20 metres at an angle across the pool.

Calculate the size of the angle, ∠**JKL**.

_____

_____

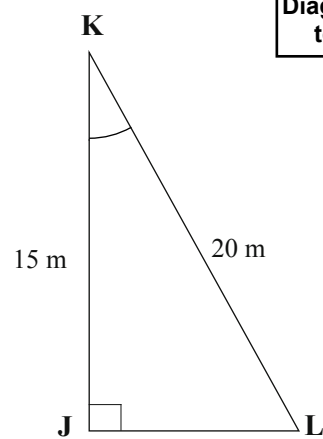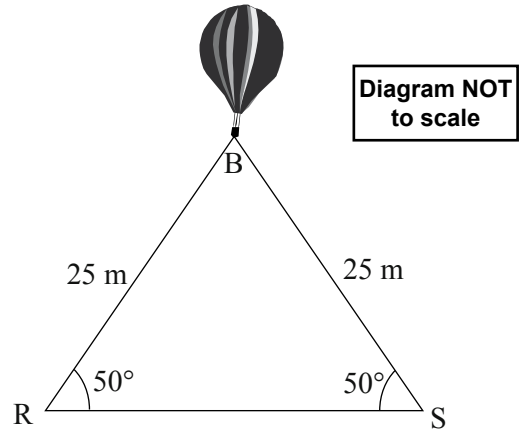_____

_____

_____

_____

∠**JKL** =_____ °

Diagram NOT to scale

K

15 m

20 m

J

L

QUESTION TWO

A hot-air balloon, **B**, is tied down to the ground by two 25 metre ropes, **BR** and **BS**.
Each rope makes an angle of 50° with the ground.

Calculate the distance between **R** and **S**.

Diagram NOT to scale

B

25 m   25 m

50°   50°

R   S

_____

_____

_____

_____

_____

Distance between **R** and **S** = _____ m

Diagram NOT to scale

QUESTION THREE

Another balloon, **A**, is tied to the ground by one rope, **TA**.
The wind is strong and the rope **TA** makes a straight line.
The balloon is 40 m above the ground.
The rope **TA** makes an angle of 26° with the ground.

Calculate the length of the rope.

A

40 m

26°

T   G

_____

_____

_____

_____

_____

_____

_____
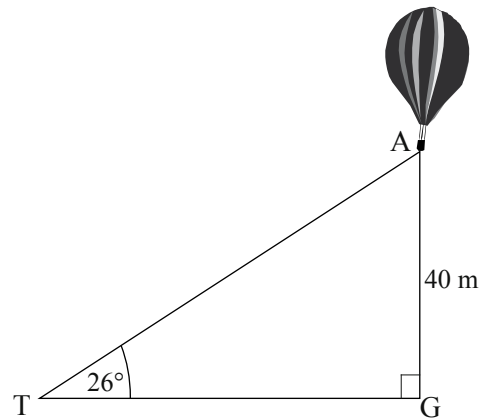
Length of rope **TA** = _____ m

QUESTION FOUR

Diagram NOT to scale

Mare is standing at a point, **M**, on a beach flying his kite, **K**.
The kite string, **KM**, is 50 m long and is pulled tight.
The kite gets stuck at the top of a tree, **KT**.
The tree is at the top of a cliff, **CT**.
Mare looks up at the kite at an angle of 49°.
Raku is standing at **R**, on a viewing deck.
He is 6 m from the **bottom** of the tree, as shown in the diagram.
He is at the same height above the beach as the bottom of the tree.
Raku looks up at the kite at an angle of 58°.

Calculate the height of the cliff, **CT**.

58°   6 m

R

50 m

T

M   49°

C

K
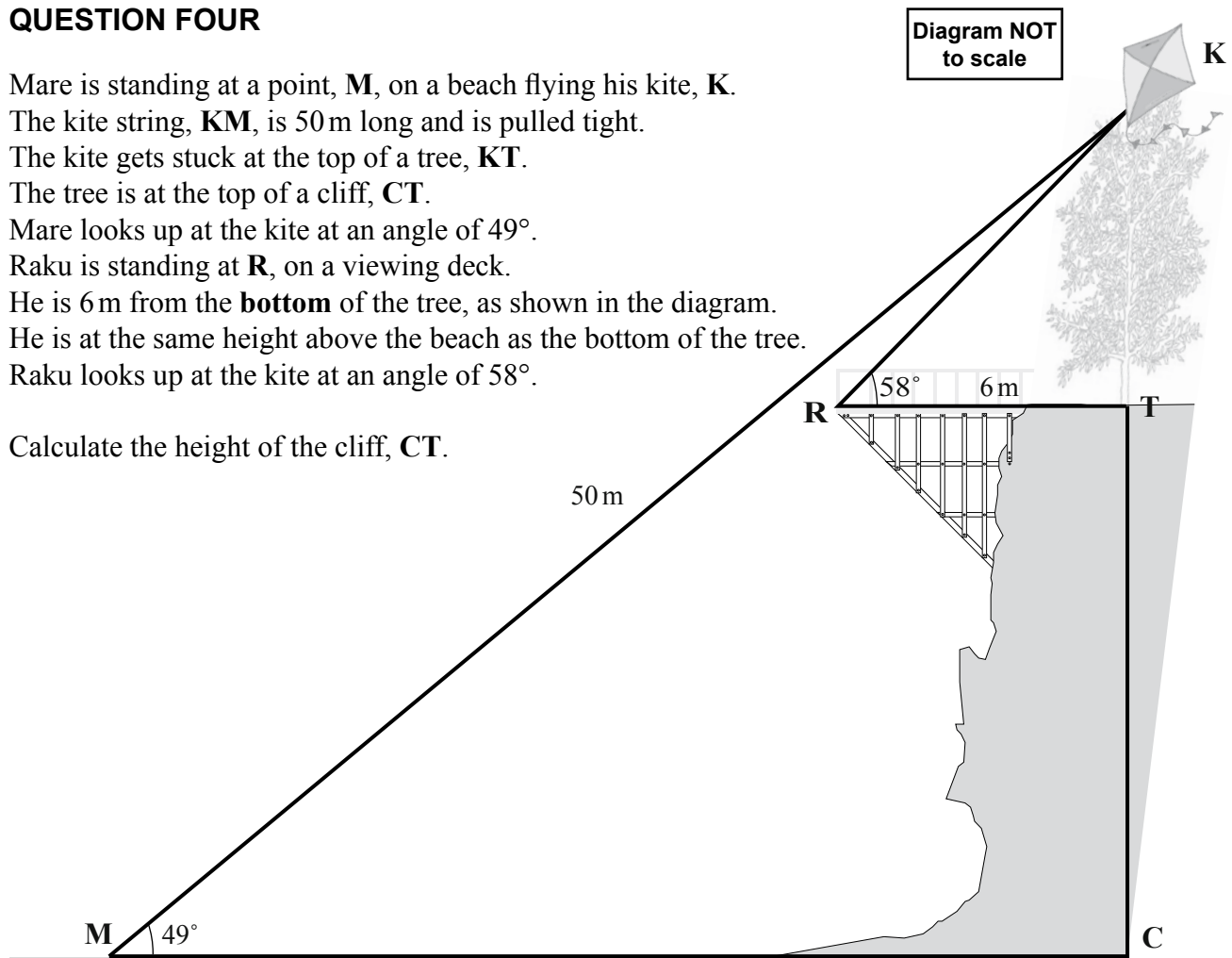
Height of cliff **CT** = _____ m

QUESTION FIVE

Joe rows across a river that flows from West to East.
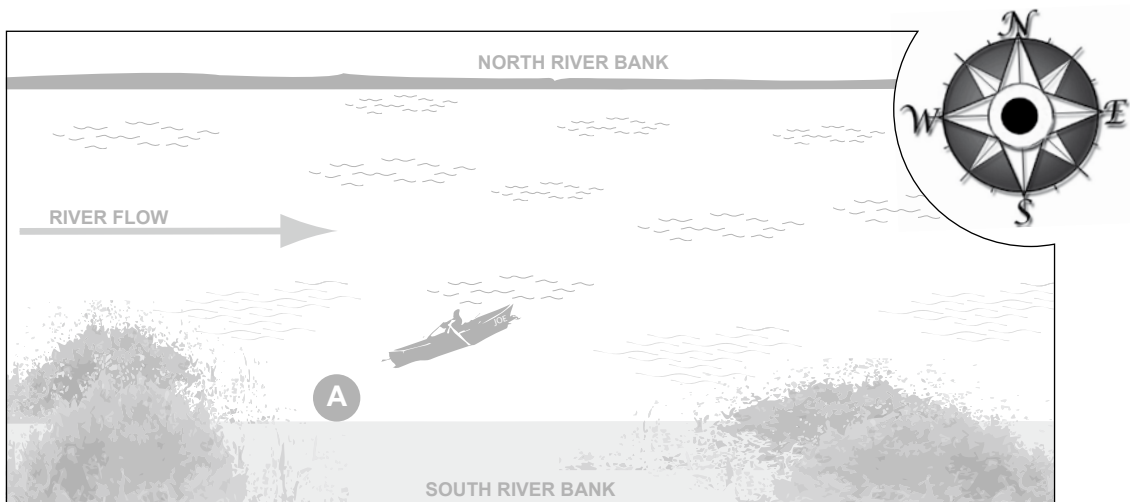The river is 37 m wide.
Joe starts rowing from **A**.
For the first part of the crossing, he rows for 32 m on a bearing of 044°.
For the second part of the crossing, Joe alters course to a bearing of 330°.
He rows in this direction until he reaches the other side of the river.

What distance did Joe row, in the second part of the crossing?

Diagram NOT to scale

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

Question number

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Question number