For Supervisor's use only

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90194

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

Level 1 Mathematics, 2004

90194 Determine probabilities

Credits: Two
9.30 am Thursday 11 November 2004

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 pages 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.

Achievement Criteria *For Assessor's use only*		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Determine probabilities. ☐	Solve probability problems using theoretical methods. ☐	Explore probability situations to solve problems. ☐
	Overall Level of Performance ☐	

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

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Go for Gold

You should show **ALL** working.

QUESTION ONE

The table shows the sports in which New Zealanders won Olympic Games medals, before the year 2000.

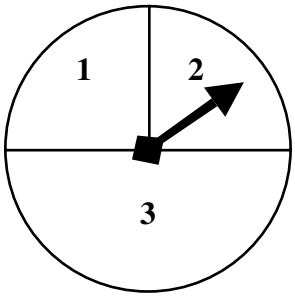
	Gold medals	Silver medals	Bronze medals	Totals
Water sports	17	8	13	38
Athletics	8	1	9	18
Other sports	5	4	6	15
Totals	30	13	28	71

(a) What is the probability that a randomly chosen New Zealand Olympic medal is a gold medal?

(b) What is the probability that a randomly chosen New Zealand Olympic gold medal was won in a water sport?

QUESTION TWO

Whetu and Val are playing a game with a spinner.
The spinner has sectors labelled "1", "2" and "3" as shown in the diagram.
Each person spins the arrow once.



(a) What is the probability that Whetu and Val both spin "3" ?

(b) What is the probability that both Whetu and Val spin the same number?

QUESTION THREE

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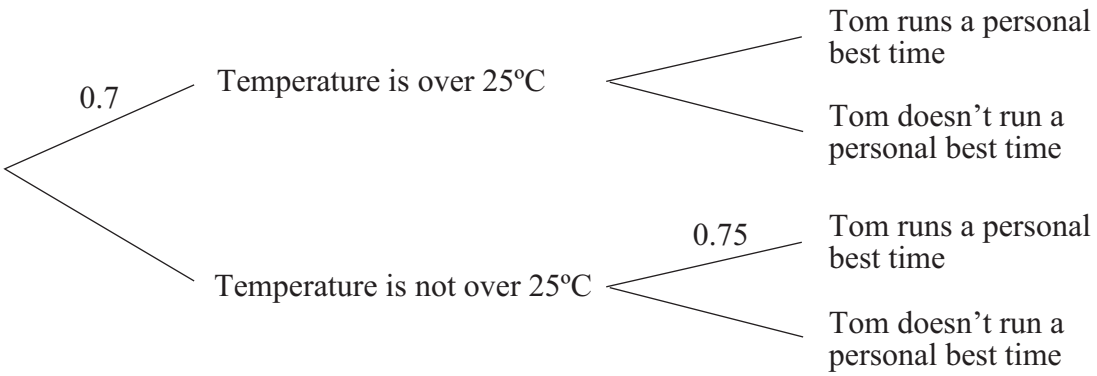
Tom is going to run a 1500 m race.
He has run personal best times in 18 out of 30 races when the temperature was **over 25ºC**.
He has run personal best times in 15 out of 20 races when the temperature was **25ºC or under**.
At this time of the year, 70% of the days have a temperature over 25ºC.

Some of the information is already shown on the diagram below.



(a) What is the probability that Tom runs a personal best time **and** the temperature is over 25ºC?

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(b) What is the probability that Tom runs a personal best time in the race?

_____

_____

_____

If the temperature is 25ºC or below **and** he runs a personal best time, his probability of winning the race is $\frac{2}{3}$.

(c) What is the probability that, if the temperature is 20ºC, he runs a personal best time but does not win the race?

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_____

QUESTION FOUR

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At the Olympic games, New Zealand has one competitor in each of the 100 m Backstroke, 100 m Breaststroke and the 100 m Butterfly.

The Backstroke swimmer has a probability of 0.18 of qualifying for the final.

The Breaststroke swimmer has probability of 0.10 of qualifying for the final.

The Butterfly swimmer has a probability of 0.28 of qualifying for the final.

What is the probability that there will be **at least two** New Zealanders in the finals?

You must support your answer with calculations.

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

Question Number

Assessor's use only

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

Assessor's use only

Question Number