



For Supervisor's use only

1

90194



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA



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

Level 1 Mathematics, 2003

90194 Calculate relative frequencies and theoretical probabilities

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 page 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.

Achievement Criteria			For Assessor's use only
Achievement	Achievement with Merit	Achievement with Excellence	
Determine probabilities. <input type="checkbox"/>	Solve theoretical probability problems. <input type="checkbox"/>	Devise strategies to explore probability situations. <input type="checkbox"/>	
		Solve theoretical probability problems. <input type="checkbox"/>	
Overall Level of Performance (all criteria within a column are met)			<input type="checkbox"/>

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

Give Me a Chance

Show **ALL** working.

QUESTION ONE

Students from 4 different countries were representing their country at an international 'Future Leaders' meeting.

The table below contains some information about the number of students from each country and the reason for their selection.

Country	Sporting Representative	Cultural Representative	Academic Representative	Total
England	5	5	6	
India	3	2		9
Canada		4	4	
New Zealand	4	3	4	
Total	17			49

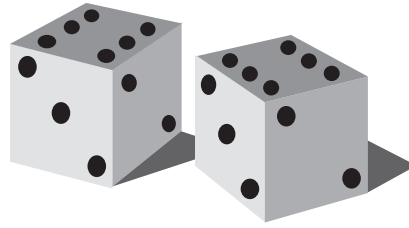
A newspaper reporter interviewed some of the students.

- (a) The first student interviewed was a cultural representative.
What is the probability that the student was representing New Zealand?

- (b) The next student interviewed was from India.
What is the probability that the student was an academic representative?

QUESTION TWO

Suzanne and Shayne are playing a game.
They are using two dice.
They have to throw a double six (six on both dice) to start.



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- (a) What is the probability that on her next throw Suzanne throws a double six?

- (b) What is the probability that Shayne will get a double of any number on his next throw?

QUESTION THREE

Mark has been collecting data about his bus trip to school each day for his maths project. He records:

- whether the weather is wet or fine
- if the bus is less than 3 minutes late
or
if it is 3 or more minutes late
- if he gets a seat or has to stand.

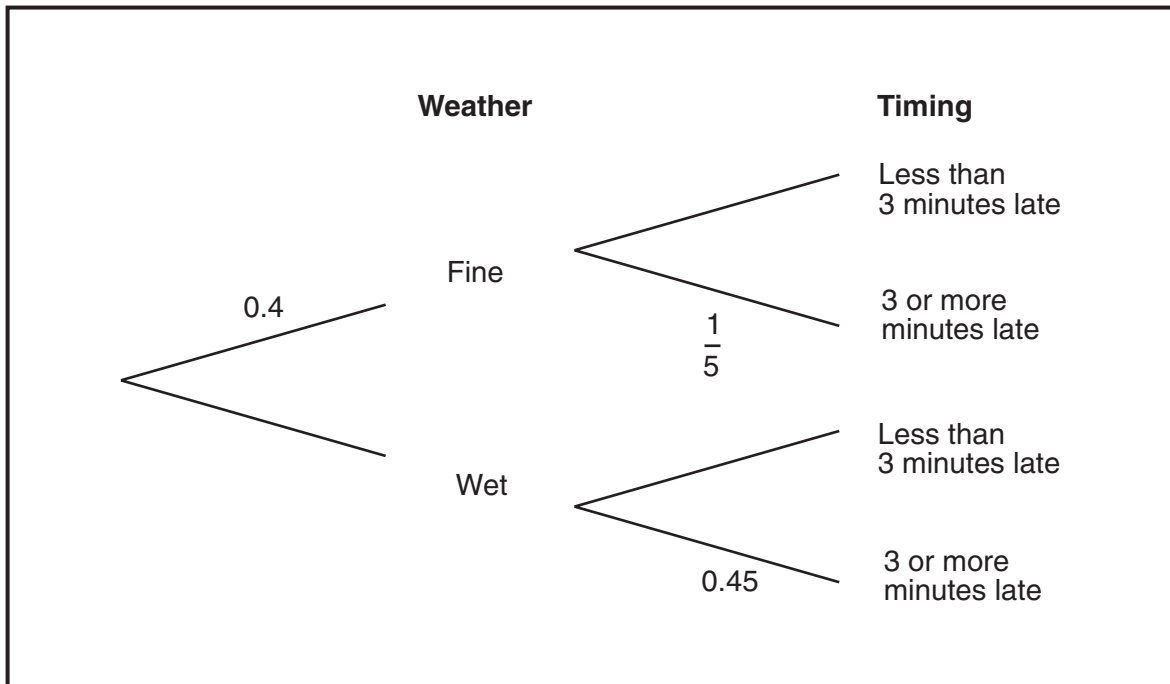


The bus is never early.

His results show:

- it is fine for 0.4 of the days
- if it is fine, the bus is 3 or more minutes late 1 day in 5
- if it is wet, the probability that the bus is 3 or more minutes late is 0.45.

He begins to draw a probability tree to help with his calculations.



(a) What is the probability that on any day:

(i) the weather was **wet** and the bus was **less than 3 minutes late**?

(ii) the bus was **3 or more minutes late**?

(b) The probability that Mark **gets a seat** on a wet day is **0.3**.

Given that it is a **wet day**, what is the probability that the bus is **3 or more minutes late** and Mark has to **stand**?

(a) Sara has maths on **four** days each week.

The day is chosen at random by the teacher.

Sara says she did her homework on 32 out of the 40 days on which she had maths last term.

(1) she had **not done** her homework

(2) the teacher checked.

- Assume that you have access to: coins, cards, spinners, dice and a random number generator on a calculator or computer.
- You must give sufficient detail in your description so that someone else could carry out the experiment.
- You must state what you will record and how you will calculate the probability.
- **Do not do the experiment.**

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.

- (b) Mark is in the same class. He said the probability that he got a detention was 0.175. Calculate the probable number of nights out of the 40 on which Mark did not do his homework.

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

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Question
Number

[illegible]