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, 2005

90194 Determine probabilities

Credits: Two
9.30 am Monday 21 November 2005

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 2–7 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**	
Determine probabilities.		Solve probability problems using theoretical methods.		Explore probability situations to solve problems.	
Overall Level of Performance					

You are advised to spend 25 minutes answering the questions in this booklet.

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SCHOOL PROBABILITY

You should show **ALL** working.

QUESTION ONE

Student Numbers at Waterview High School

Year Level	Year 9	Year 10	Year 11	Year 12	Year 13	Totals
Boys	110	120	125	70	35	460
Girls	120	135	135	75	45	510
Totals	230	255	260	145	80	970

(a) What is the probability that a randomly chosen **student** was in Year 11?

Probability is _____

(b) What is the probability that a randomly chosen **boy** was in Year 11?

Probability is _____

QUESTION TWO

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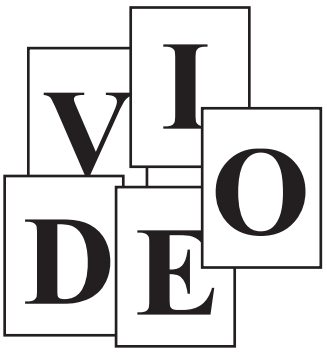

The school tuckshop wants students to buy healthy foods and has introduced an incentive scheme to encourage this.

The tuckshop has a large number of cards, each with a letter printed on it. The letters on the cards are either **V, I, D, E,** or **O**. Each time a student buys healthy food they are given one of these cards. Assume the probability of getting each letter is the same.

When the student has collected the 5 different letters, the cards can be exchanged for a free video rental ticket.

(a) Andy buys two healthy foods and is given two cards.
What is the probability the two cards are both "**D**"?

Probability is _____

(b) Wiki buys two healthy foods and is given two cards.
What is the probability that the two cards have different letters?

Probability is _____

(c) Zoe gets a card on Wednesday and another card on Thursday.
What is the probability that Zoe has exactly one **V**?

Probability is _____

QUESTION THREE

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Over the years, the Athletic Sports at Waterview High School have been scheduled for February 45% of the time, and scheduled for March 55% of the time.

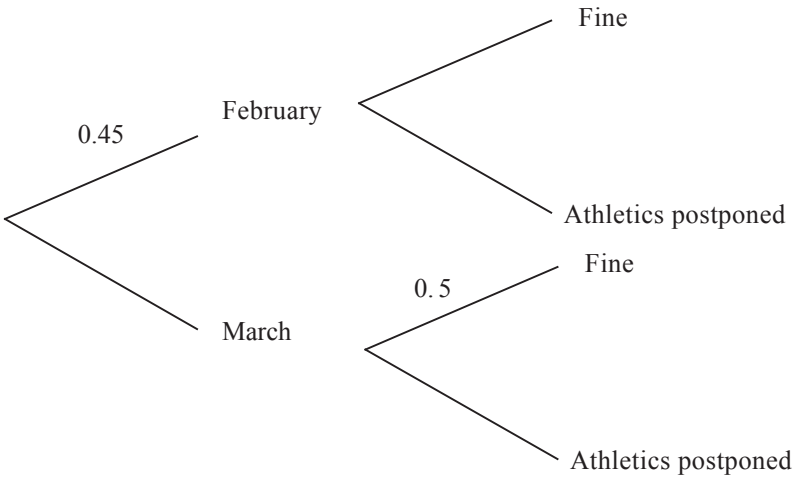
If the sports are held in February, then the probability of fine weather on the chosen day is 0.7.

If the sports are held in March, then the probability of fine weather on the chosen day is 0.5.

If the weather on the chosen day is not fine, then the sports are postponed to a later date.

(a) What is the probability that the Athletic Sports were postponed in a randomly chosen year?

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



Probability is _____

(b) When the postponement date is not fine, the Athletic Sports are not held at all that year.

If a February date is postponed, there is a 25% chance the sports are not held that year.

If a March date is postponed, there is a 60% chance the sports are not held that year.

What is the probability that the Athletics Sports are not held in a randomly chosen year?

Probability is _____

QUESTION FOUR

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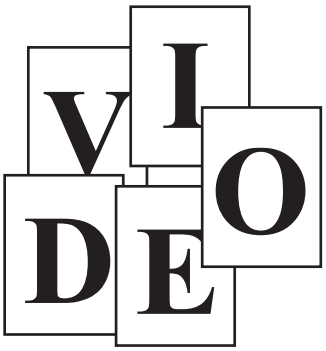
This question uses information from the first three paragraphs in Question 2, reprinted in the box below.

> The school tuckshop wants students to buy healthy foods and has introduced an incentive scheme to encourage this.
>
> The tuckshop has a large number of cards, each with a letter printed on it. The letters on the cards are **V, I, D, E,** or **O**. Each time a student buys healthy food they are given one of these cards. Assume the probability of getting each letter is the same.
>
> When the student has collected the 5 different letters, the cards can be exchanged for a free video rental ticket.



Bree wants to find out how many healthy food items she would need to buy, on average, to get the 5 different letters, **V, I, D, E,** and **O**, needed for a free video rental ticket.

Describe a probability experiment to simulate this situation. Your description must be clear enough for someone else to follow. It must list all the instructions needed to get an answer to the question: **"What is the average number of items needed to get a free video rental ticket?"**

Bree has access to such tools as: dice, coins, cards, calculator with random number key, random number tables.

Do NOT do the probability experiment.

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

Assessor's use only

Question number

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