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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Mathematics, 2008

90194 Determine probabilities

Credits: Two
9.30 am Monday 24 November 2008

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 2–6 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.

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 30 minutes answering the questions in this booklet.

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QUESTION ONE

Jan has three different kinds of flowers in her garden.
There are four different colours of flowers.
The table shows the colours of the flowers on her birthday.

Flowers	Purple	Yellow	Red	White	Totals
Sweet Peas	15	0	63	21	99
Roses	0	2	5	3	10
Pansies	20	20	15	10	65
Totals	35	22	83	34	174

(a) On her birthday Jan picked a flower at random from her garden.

What was the probability that it was a red flower?

(b) Bob picked a pansy at random from Jan's garden on her birthday.

Assuming that Jan's flower in (a) wasn't a pansy, what is the probability that Bob's pansy was white?

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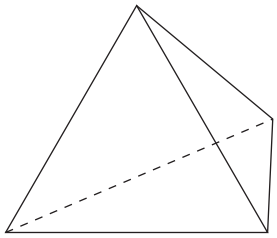
QUESTION TWO

Tania has a collection of tracks on her MP3 player from ***Black Seeds***, ***Shihad*** and ***Fastcrew***.
For every ***Black Seeds*** track there are two ***Shihad*** tracks.
There are three times as many ***Fastcrew*** tracks as there are ***Shihad*** tracks in her collection.
Geoff selected a track at random from Tania's collection.

What is the probability that he selected a ***Black Seeds*** track?

QUESTION THREE

Kevin has a tetrahedral die, as shown, that has the numbers 1, 2, 3 and 4 on its four equal faces.



Kevin throws the die twice, recording the number that was on the bottom face of the die each time.

(a) What is the probability that he recorded two 3s?

(b) What is the probability that the total of the two numbers he recorded is less than 5?

QUESTION FOUR

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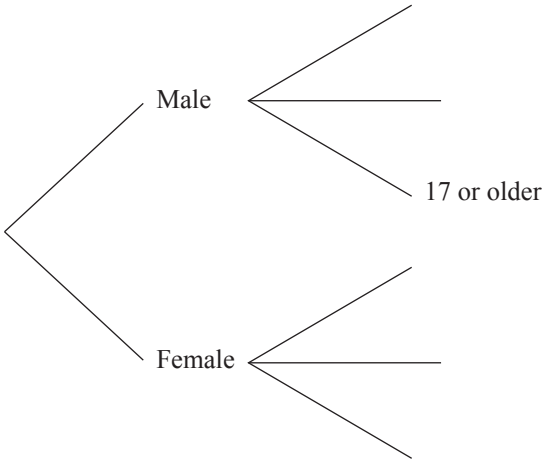
The Newtown Licensing Office recorded details on the age and gender of people applying for driving licences for the first time.

Their records show that during the year:

- 55% of applicants were male.
  Of these, 30% were 15 years old,
  25% were 16 years old
  and the rest were 17 years or older.

- For the females:
  20% were 15 years old,
  15% were 16 years old
  and the rest were 17 years or older.

Some of this information is shown on a tree diagram.



(a) A person applying for a driving licence for the first time at the Newtown Licensing Office is chosen at random.

What is the probability that the person chosen was a male seventeen years or older?

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(b) A person applying for a driving licence for the first time at the Newtown Licensing Office is chosen at random.

What is the probability that the person chosen was 15 years old?

(c) Last year 198 females who were 15 years old applied for a driving licence for the first time.

Estimate the number of 15-year-old males who applied for a driving licence for the first time.

(d) It is known that 10% of all males and 1% of all females have a colour vision problem.

Of the 2500 people applying for a driving licence for the first time at the Newtown Licensing Office so far this year, how many would be expected to be 16-year-olds with a colour vision problem?

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

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Question number	