To be completed by Candidate and School:	
Name:	
NSN No:	
School Code:	

1

SUPERVISOR'S USE ONLY

DAY 2
THURSDAY

NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Level 1 Mathematics and Statistics CAT, 2017

91027 Apply algebraic procedures in solving problems

Thursday 21 September 2017
Credits: Four

You should attempt ALL the questions in this booklet.

Calculators may NOT be used.

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.

You are required to show algebraic working in this paper. 'Guess and check' and 'correct answer only' methods do not demonstrate relational thinking and will limit the grade for that part of the question to a maximum of Achievement. Guess and check and correct answer only may only be used a maximum of one time in the paper and will not be used as evidence of solving a problem.

A candidate cannot gain Achievement in this standard without solving at least one problem.

Answers must be given in their simplest algebraic form.

Where a question is given in words you will be expected to write an equation.

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.

ASSESSOR'S USE ONLY	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Apply algebraic procedures in solving problems.	Apply algebraic procedures, using relational thinking, in solving problems.	Apply algebraic procedures, using extended abstract thinking, in solving problems.
		Overall level of performance

QUESTION ONE

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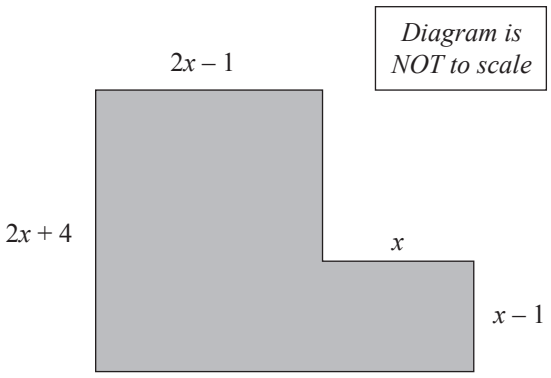
(a) The area, A m^2, to be concreted for a pathway and barbecue area is given by

$$A = xy + 5y^2$$

If $x = 2$, and $y = 4$, calculate the area to be concreted.

(b) Solve $3x^2 + 8x - 16 = 0$.

(c) A plan is made by joining two rectangles.



(i) What is the perimeter of the plan in terms of x?

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(ii) The area of the plan is 146 cm^2.

What is the value of x?

(d) Riki thinks of a number N.
When Riki's number is squared, he gets k less than N plus 4 .
When Riki's number is cubed, the answer is m times N .

Give an expression for k in terms of m only.

QUESTION TWO

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(a) The area of a rectangle can be represented by:

$3x^2 - 4x - 32$

(i) State the length and width of this rectangle in terms of x.

(ii) Given that this quadratic expression represents the area of a rectangle, what would be the possible values of x?

Justify your answer.

(b) If $x - 5y + 15 = 0$ and $-5x + y + 21 = 0$, what is the value of $x + y$?

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(c) Jane is planning to fence an area for her pet lamb .

Jane's father tells her that he had planned to make it square with the sides of length x.

Jane decides to make it a rectangle with the length 5 metres longer than x, and the width 2 metres wider than x.

Jane's father says the area of Jane's pen is 24 m^2 larger than what he had planned to make.

What was the area of the pen that Jane's father had planned to make?

(d) Pita is going on holiday for 5 weeks.

He looks after pet cats and dogs when their owners go away.

While Pita goes on holiday, his neighbour is going to feed the 13 pets he is looking after.

Pita spends a total of $445 on the food for the pets before he leaves.

On average the cost for food for a week is $5 to feed one cat, and $9 to feed one dog.

How many cats and how many dogs did Pita have for the neighbour to feed?

QUESTION THREE

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(a) $n = 9m^2 - 16$

Give the equation for m in terms of n.

(b) Simplify $\dfrac{6x^2 - 18x}{2x^2 - 7x + 3}$.

(c) $5^{x^2-6} > 5^x$

Find the value(s) of x.

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(d) Solve $16 \times 4^{x-5} > 65$ when x is a whole number.

(e) A and B are two consecutive even numbers where $B > A$.

If $C = \frac{B}{A} - \frac{A}{B}$, give the value of C in terms of A,

and explain that this will always be $\frac{\text{an even number}}{\text{an even number}}$.

Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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91027B