To be completed by candidate and school

Name: _____

NSN

School Code

1

SUPERVISOR'S USE ONLY

DAY 2
THURSDAY

NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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COMMON ASSESSMENT TASK

Level 1 Mathematics and Statistics 2021

91027 Apply algebraic procedures in solving problems

Thursday 16 September 2021
Credits: Four

You should attempt ALL the questions in this booklet. Show ALL working.

Calculators may NOT be used.

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, using algebra.

Answers must be given in their simplest algebraic form.

Where a question is given in words, you are expected to show the equation that you used to solve the problem.

Check that this booklet has pages 2–10 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

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QUESTION ONE

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(a) Given that the perimeter of the shape shown below is 35 cm, find the value of y.

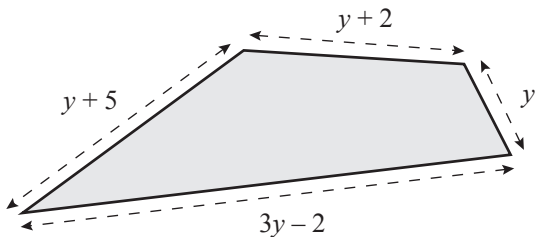

Diagram is NOT to scale

(b) Solve the inequality: $(4x + 3)(2x - 1) \geq (x - 2)(8x + 1)$

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(c) The perimeter of rectangle A is 20 cm, and the perimeter of rectangle B is 26 cm, in the diagram below.

Find the length and width of rectangles A and B.

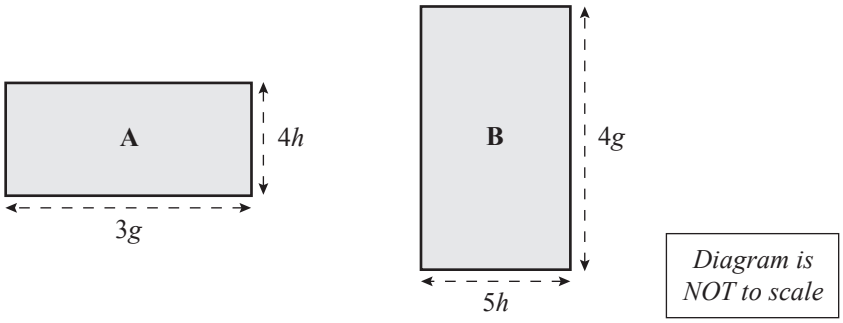

Diagram is NOT to scale

(d) Solve the equation: $\frac{y+3}{4} - \frac{2y-3}{3} = 3$

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(e) A flower bed, 9 metres long and 6 metres wide, lies in the centre of a fenced backyard, leaving a border x metres wide between each edge of the flower bed and the fence.

The area of the whole backyard is double the area of the flower bed.

Find the width, x metres, of the border.

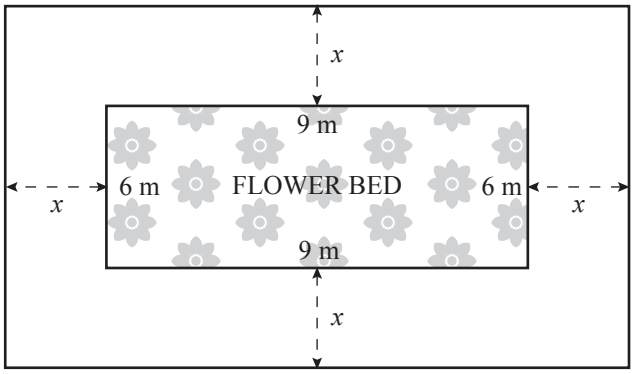

Diagram is NOT to scale

QUESTION TWO

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(a) What is the area of a square with sides of length $(4y + 7)$ cm?
Give your answer in terms of y and in the form $ay^2 + by + c$.

(b) Solve the equation: $2^{2y} \times 2^{2y-12} = 16$

(c) Solve the equation: $\dfrac{3}{y-4} - \dfrac{3}{y+4} = \dfrac{2}{y+1}$

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(d) Simplify, as far as possible: $\dfrac{3x^2 - 2x - 8}{3x^2 - 12}$

(e) Billi has been painting some straight lines on a field for her netball team to do some training exercises.

The total length of all the painted lines shown in the diagram below is 16 metres.

If the shaded area is 10 m^2, find the possible values of x.

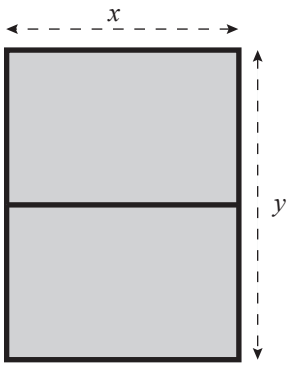

Diagram is NOT to scale

QUESTION THREE

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(a) Find the value of $3y^2 - 4xy$ when $x = 2$ and $y = -3$.

(b) The equation $5 = 3x^2 - 14x$ has two solutions, a and b, with a being greater than b.

What is the value of $a - b$?

(c) Find the values of the numbers v and w that will make $(3x + v)^2 = 9x^2 + wx + 16$ true, given that both v and w are positive numbers.

(d) Solve the equation: $g^4 - 8g^2 + 16 = 0$

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(e) If $T = \dfrac{7p - 6q}{p - 3q}$, give the equation for q in terms of p and T.

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

91027B