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90147

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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Level 1 Mathematics, 2007

90147 Use straightforward algebraic methods and solve equations

Credits: Four
9.30 am Tuesday 20 November 2007

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**
Use straightforward algebraic methods. ☐		Use algebraic methods and solve equations in context. ☐	Use algebraic strategies to investigate and solve problems. ☐
Solve equations. ☐			
Overall Level of Performance (all criteria within a column are met) ☐			

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

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You should show ALL working.

QUESTION ONE

Expand and simplify: $3(x + 4) – 2(x + 5)$

QUESTION TWO

Factorise: $x^2 – 5x – 14$.

QUESTION THREE

Andy knows that $3y^2 \times 4y^n = 12y^8$.

What is the value of n?

QUESTION FOUR

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Solve these equations:

(a) $5m - 7 = 2m + 5$

(b) $(2x - 1)(x + 3) = 0$

(c) $\frac{5x}{2} - 5 = 3$

QUESTION FIVE

Simplify fully:

$\frac{(2p^2 - 12pq)}{6p^2} =$

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QUESTION SIX

Graham is using the formula $A = \pi\sqrt{\frac{w}{g}}$.

He wants to make w the subject of the formula.

Rewrite the formula with w as the subject.

QUESTION SEVEN

The sides of a square warehouse are extended by 2 m and 3 m as shown in the diagram.

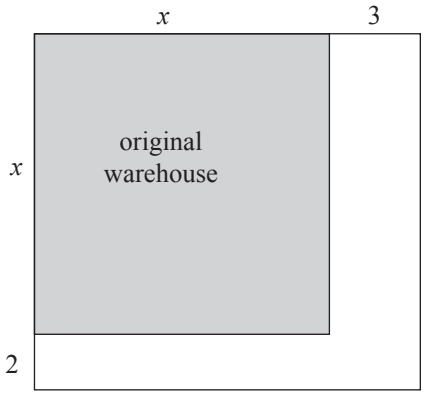

Diagram is NOT to scale

The area of the extended warehouse is 156 m^2.

Solve the equation $(x + 2)(x + 3) = 156$ to find the length of one side of the original warehouse.

Length of one side of the original warehouse = _____ metres

QUESTION EIGHT

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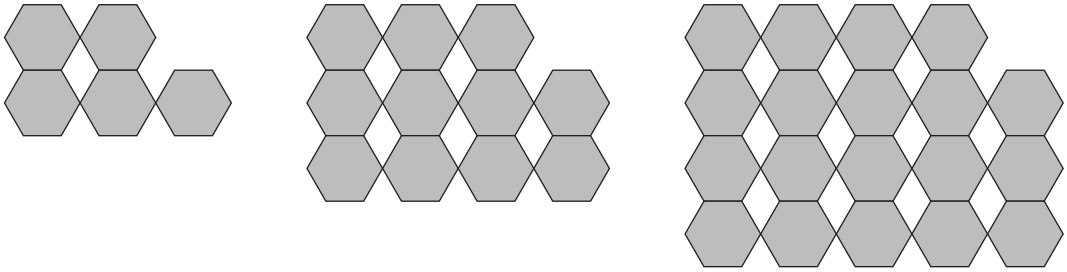
Alison is using hexagonal tiles to make patterns.

Pattern 1 **Pattern 2** **Pattern 3**



Alison has 461 hexagonal tiles.
She wants to use all of the tiles to make a pattern like those in the diagrams above.
Write an equation to show the relationship between the pattern number, n, and the number of tiles used, T.
Solve this equation to find the pattern number that would have 461 tiles.

You must: write an equation,
solve the equation,
write down the pattern number with 461 tiles.

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

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Question number

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