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90147

NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Mathematics, 2008

90147 Use straightforward algebraic methods and solve equations

Credits: Four
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 2–7 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**
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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QUESTION ONE

Solve these equations:

(a) $6x(x-4)=0$

(b) $4(t+3)=3$

QUESTION TWO

Pam sends Christmas cards to her friends.
The stamps cost 50 cents for each friend.
The cards cost $2.75 for each friend.
She spends a total of $68.25.
The equation for the amount she spends is:

$$0.50f + 2.75f = 68.25$$

where f is the number of friends she sends Christmas cards to.

Solve this equation to find how many friends she sent Christmas cards to.

Number of friends she sent Christmas cards to = _____

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QUESTION THREE

Expand and simplify: $2(x - 1) - 3(x + 2)$

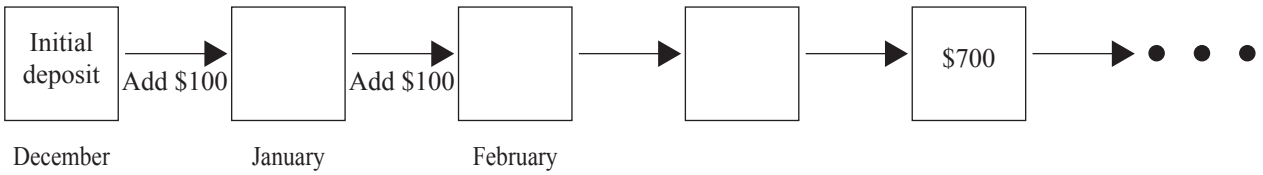
QUESTION FOUR

Anne was told that one factor of $(x^2 + 48x - 100)$ is $(x - 2)$.

What is the other factor?

QUESTION FIVE

In December, Garry's mother opened a savings account for his tertiary study.
She made an initial deposit and then added $100 to the savings account every month.
After 4 months there was $700 in total in the savings account, as shown in the diagram.



No interest is added to the account during this time.

Write an expression for the total amount of money, A, that his mother has put in the savings account after m months.

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QUESTION SIX

Simplify: $\frac{2m}{3}+\frac{4m}{5}$

QUESTION SEVEN

There are V litres of water in David's tank.
There are d "drippers" on the irrigation line from the tank that can be used to water his garden.
Each "dripper" uses x litres of water per day.

(a) Write an expression to show the amount of water, A, left in the tank after one day.

(b) At the end of the day on the 2nd of November there were 120 litres of water in the tank.

The next day, 3 "drippers" were used.
At the end of that day there were 39 litres of water left.

Use your expression above to show how much water each "dripper" used that day.

Amount of water A used by each dripper = _____ litres

QUESTION EIGHT

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Jim needs to make a path from the front to the back of his house, as shown in the diagram.

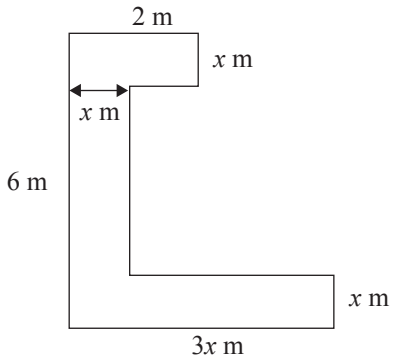

Diagram is NOT to scale

x is the width of his path, in metres.

Jim has sufficient concrete to make a path with a total area of 9 m^2.

The area of the path can be written as $2x + 3x^2 + (6 - 2x)x = 9$

Solve the equation $x^2 + 8x - 9 = 0$
to find the width of the path around his house.

Width of Jim's path = _____ metres

QUESTION NINE

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Sheffield school uses two vans to take a group of students on a field trip.

- If two students moved from van A to van B, **then** the two vans would have the same number of students in each.
- If, instead, two students moved from van B to van A, **then** van B would have half the number of students that were then in van A.

Use this information to find the **total** number of students on the field trip.

You must give at least one equation that you use in solving the problem.

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

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Question number