See back cover for an English translation of this cover

1

91028M

910285

SUPERVISOR'S USE ONLY

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Te Pāngarau me te Tauanga, Kaupae 1, 2013

91028M Te tūhura i ngā pānga i waenganui i ngā papatau, ngā whārite me ngā kauwhata

9.30 i te ata Rāapa 13 Whiringa-ā-rangi 2013
Whiwhinga: Whā

Paetae	Paetae Kaiaka	Paetae Kairangi
Te tūhura i ngā pānga i waenganui i ngā papatau, ngā whārite me ngā kauwhata.	Te tūhura i ngā pānga i waenganui i ngā papatau, ngā whārite me ngā kauwhata mā te whakaaro whaipānga.	Te tūhura i ngā pānga i waenganui i ngā papatau, ngā whārite me ngā kauwhata mā te whakaaro waitara hōhonu.

Tirohia mehemea e ōrite ana te Tau Ākonga ā-Motu (NSN) kei tō pepa whakauru ki te tau kei runga ake nei.

Me whakautu e koe ngā pātai KATOA kei roto i te pukapuka nei.

Whakaaturia ngā mahinga KATOA.

Ki te hiahia koe ki ētahi atu wāhi hei tuhituhi whakautu, whakamahia te (ngā) whārangi kei muri i te pukapuka nei, ka āta tohu ai i ngā tau pātai.

Tirohia mehemea kei roto nei ngā whārangi 2–19 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

Kia 60 meneti hei whakautu i ngā pātai o tēnei pukapuka.

MĀ TE KAIMĀKA ANAKE

PĀTAI TUATAHI

(a) Ia tau i te Kirihimete, ka hoatu e te kuia o Jamie he rima tāra ki a ia me te rua tāra atu anō mō ia tau o tōna pakeke. E whakaaturia ana i raro nei ko tōna pakeke me te tapeke mō ngā Kirihimete e toru.

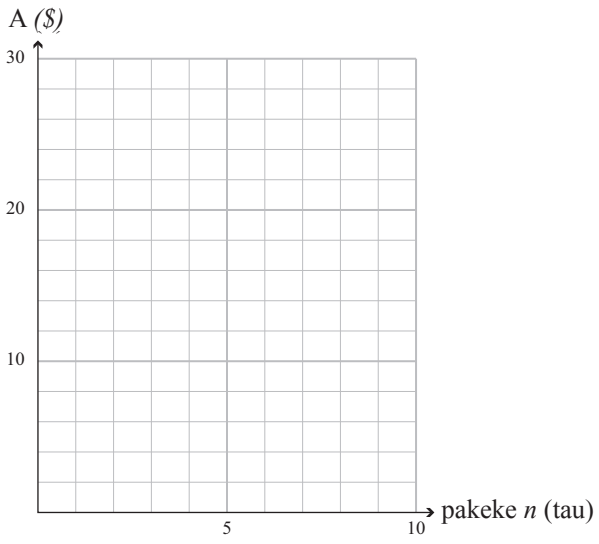
Pakeke, n	Te tapeke i whiwhi a Jamie, A	
1	\$7	
2	\$9	
3	\$11	

(i) Tuhia te whārite mō te tapeke, A, i whiwhi a Jamie mai i tōna kuia e pā ana ki tōna pakeke, n, i te Kirihimete.

(ii) Tātaihia te tapeke i whiwhi a Jamie mai i tōna kuia i te Kirihimete i te wā 12 ōna tau.

Me whakaatu e koe ngā whakamahinga o tō whārite mai i te wāhanga (i).

(iii) I te tukutuku i raro nei, tuhia te kauwhata e whakaatu ana i te nui o te moni i hoatu e te kuia o Jamie ki a ia mō ia Kirihimete.



Ki te hiahia koe ki te tuhi anō i tēnei kauwhata, whakamahia te tukutuku i te whārangi 14.

You are advised to spend 60 minutes answering the questions in this booklet.

ASSESSOR'S USE ONLY

QUESTION ONE

(a) Each year at Christmas, Jamie's grandmother gave him five dollars plus two dollars for each year of his life. His age and the amount he received for three Christmases is shown in the table below.

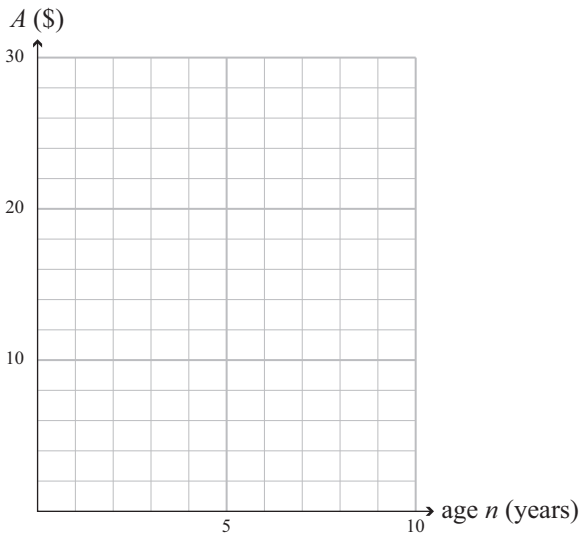
Age, n	Amount Jamie received, A	
1	\$7	
2	\$9	
3	\$11	

(i) Write the equation for the amount, A, Jamie was given by his grandmother in terms of his age, n, at Christmas.

(ii) Find the amount Jamie was given by his grandmother at Christmas when he was 12.

You must show use of your equation from part (i).

(iii) On the grid below plot the graph that shows the amount of money that Jamie's grandmother had given him for each Christmas.



If you need to redraw this graph, use the grid on page 15.

MĀ TE KAIMĀKA ANAKE

(iv) E toru tau te tamariki ake o te teina o Jamie, a Arna, i a ia.

Ia Kirihimete ka hoatu e te kuia o Arna he rima tāra anō ki a ia me te rua tāra atu anō mo ia tau o tōna pakeke.

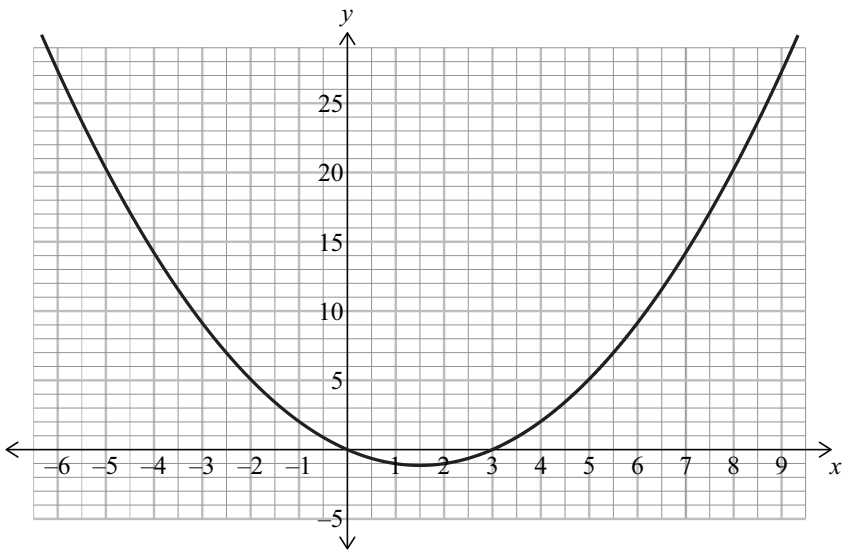
Ki te tukutuku mō te wāhanga (iii), tuhia te kauwhata e whakaatu ana i te **tapeke** i hoatu e tō rāua kuia ki a rāua tahi ia Kirihimete.

(v) I tēnei Kirihimete he $44 te tapeke i whiwhi a Jamie rāua ko Arna mai i tō rāua kuia.

Tuhia kia kotahi te whārite i te itinga rawa me te whakamahi hoki i tēnei hei whiriwhiri i te pakeke o Jamie i tēnei Kirihimete.

(vi) Homai te whārite hei tātaitai i te tapeke i hoatu e te kuia o Jamie ki a ia i ngā Kirihimete e n.

(b) Homai te whārite mō te kauwhata e whakaaturia ana i konei.



Whārite: _____

ASSESSOR'S USE ONLY

(iv) Jamie's sister Arna is three years younger than him.

Each Christmas her grandmother also gave her five dollars plus two dollars for each year of Arna's life.

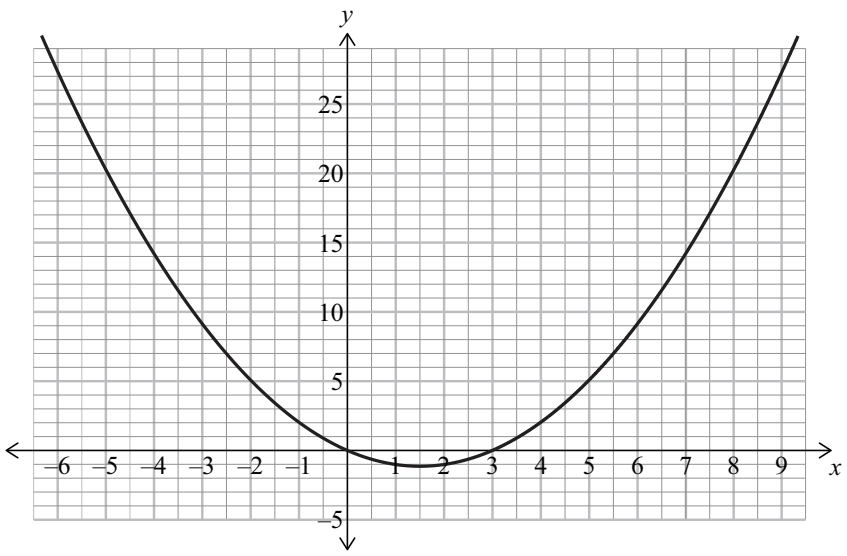
On the grid for part (iii), sketch the graph showing the **total amount** that their grandmother had given them each Christmas.

(v) This Christmas Jamie and Arna received a total of $44 from their grandmother.

Write at least one equation and use this to find how old Jamie was this Christmas.

(vi) Give the equation to calculate the total amount Jamie's grandmother had given him in n Christmases.

(b) Give the equation of the graph below.



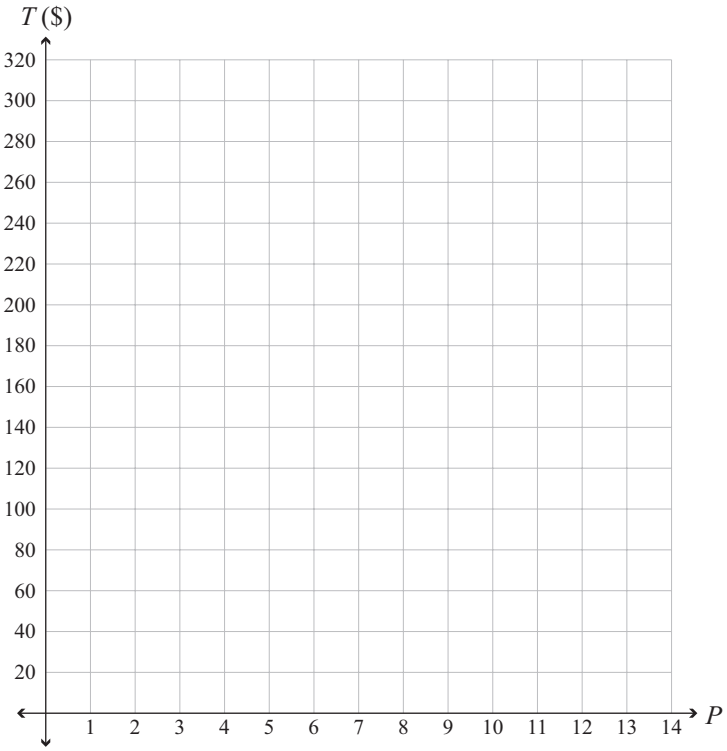
Equation: _____

PĀTAI TUARUA

MĀ TE KAIMĀKA ANAKE

(a) Kua tata te tīmata o te penapena a Marnie mō tētahi haerenga poitarawhiti kura.
He mahi harangotengote tāna.
Parakitihi ai tōna kapa poitarawhiti ia Rāmere.
14 ngā parakitihi kei te toe i mua i te haerenga.
Ka whakarite ia ki te hoatu i te $20 ki tana kaiako mō te haerenga i ia parakitihi Rāmere 14.

(i) Tuhia te kauwhata o te tapeke, T, i hoatu e Marnie ki tana kaiako i te mutunga o ia parakitihi, P.



Ki te hiahia koe ki te tuhi anō i tēnei kauwhata, whakamahia te tukutuku i te whārangi 14.

(ii) Mēnā ka tuhia he rārangi mā ngā tapeke i hoatu e ia ki tana kaiako i ia parakihiti, homai te whārite o tēnei rārangi.

(iii) Ko te tapeke o te haerenga he $300.
I muri i ētahi parakitihi āhua maha, i te utunga o Marnie i tana kaiako, ka kīia atu ia kāore e nui ana moni mō te haerenga.
Me utu haere a Marnie i te $30 i te wiki ki te kaiako kia eketia ai e ia tana whāinga o te $300.

Ki te tukutuku i runga ake, tuhia te kauwhata o te tapeke rerekē hei utu māna.

(iv) E hia ngā wiki me utu a Marnie i te tapeke nui ake kia eketia ia e ia tana whāinga o te $300 i te parakitihi 14?

(v) Homai te whārite mō te kauwhata e whakaatu ana i ngā utunga nui ake.

(b) I kitea e Sam tētahi panga i roto i tētahi pukapuka.

I kīia atu ia me whakaaro ia mō tētahi tau ka whai i ētahi tohutohu me te kite hoki he aha tana tau mō te whakautu.

I te pākiki a Sam, ka hangaia e ia tētahi papatau me te whakakī ki ētahi tau:

	Whakamātau 1	**Whakamātau 2**	**Poutū 3**
Whakaarohia tētahi tau	5	10	N
Tāpirihia he 2	7		N + 2
Whakareatia ki te 3		36	
Tāpirihia tō tau	26		
Tāpirihia he 6	32	52	
Whakawehea mā te 4	8	13	
Tangohia tō tau		3	

(i) Whakaotihia te poutū 3 o te papatau.

(ii) Whakamārama taipitopitotia he aha i 3 ai te whakautu i ngā wā katoa, ahakoa tana tau tīmatanga.

QUESTION TWO

ASSESSOR'S USE ONLY

(a) Marnie is about to start saving for a school netball trip.

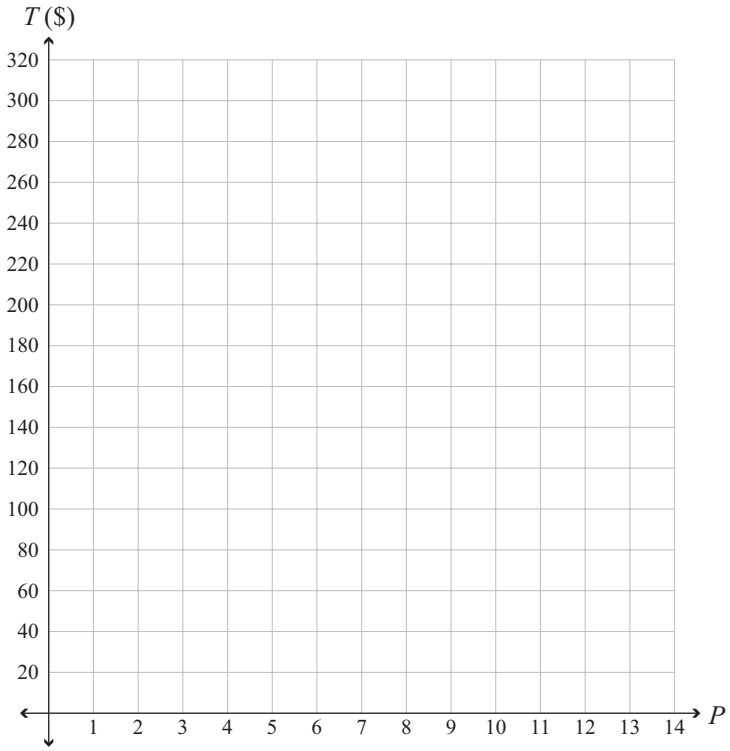
She has a part-time job.

Her netball team practises each Friday.

There are 14 more practices before the trip.

She decides to give her coach $20 for the trip at each of the 14 Friday practices.

(i) Plot the graph of the total amount, T, Marnie has given her coach at the end of each practice, P.



If you need to redraw this graph, use the grid on page 15.

(ii) If a line is drawn through the total amounts she has given her coach at each practice, give the equation of this line.

(iii) The total cost of the trip is $300.

After several practices, when Marnie has paid her coach, she is told that she is not going to have enough money for the trip.

Marnie needs to start paying the coach $30 a week so that she meets her $300 target.

On the above grid, plot the graph of the changed amount she needs to pay.

(iv) For how many weeks does Marnie need to pay the increased amount so that she meets her $300 target at the 14th practice?

ASSESSOR'S USE ONLY

(v) Give the equation for the graph representing the increased payments.

(b) Sam found a puzzle in a book.

He was told to think of a number and then to follow some instructions and see what number he had as the answer.

Sam was curious so he made a table and filled in some numbers:

	1st try	**2nd try**	**3rd column**
Think of a number	5	10	N
Add 2	7		N + 2
Multiply by 3		36	
Add on your number	26		
Add 6	32	52	
Divide by 4	8	13	
Take away your number		3	

(i) Complete the 3rd column of the table.

(ii) Explain in detail why the answer is always 3, no matter what number he starts with.

PĀTAI TUATORU

MĀ TE KAIMĀKA ANAKE

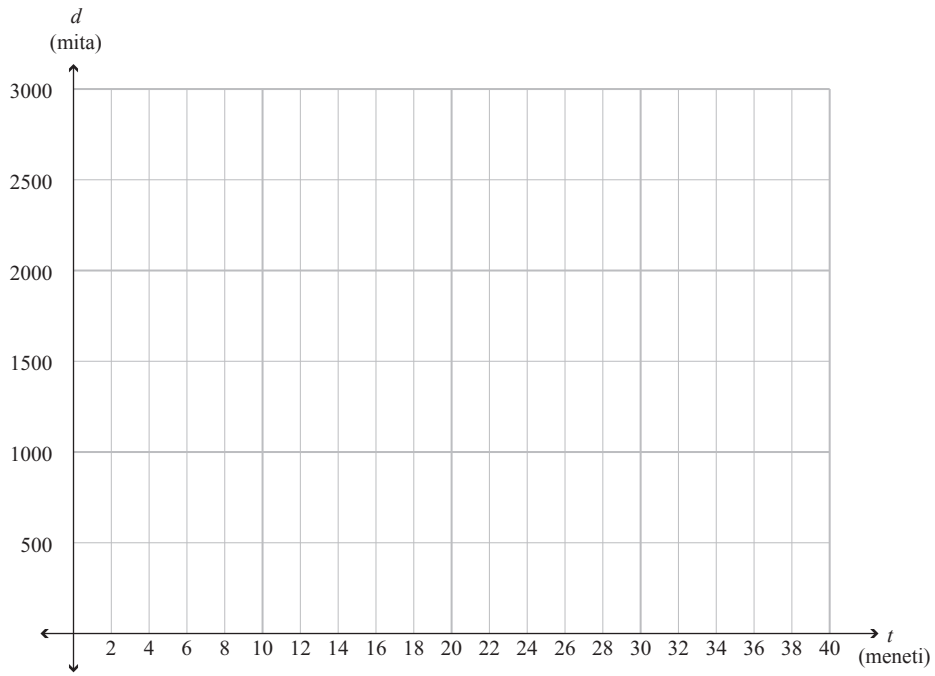
(a) Aumou te tere o te haere a Susie i runga i tana paihikara ki te whare o tōna hoa.

Kātahi ka hīkoi tahi rāua ki te kura ki tētahi tere aumou.

E whakaaturia ana i te papatau i raro te tawhiti o Susie mai i te kura.

Susie	**Te wā *t* ā-meneti mai i te wehenga i te kāinga**	**Te tawhiti *d* ā-mita mai i te kura**
Wehe i te kāinga		2500
Tae ki te kāinga o tana hoa	2	2000
Wehe i te kāinga o tana hoa	15	2000
Tae ki te kura	35	

(i) Ki te tuaka i raro nei tuhia te kauwhata o te tawhiti, *d*, o Susie mai i te kura ahakoa te wā, *t* meneti i muri i te wehenga i te kāinga.



Ki te hiahia koe ki te tuhi anō i tēnei kauwhata, whakamahia te tukutuku i te whārangi 16.

(ii) Mō tō kauwhata homai te whārite hei kimi i te tawhiti o Susie rāua ko tana hoa mai i te kura ahakoa te wā mō:

- $2 \leq t \leq 15$

- $15 < t < 35$

QUESTION THREE

ASSESSOR'S USE ONLY

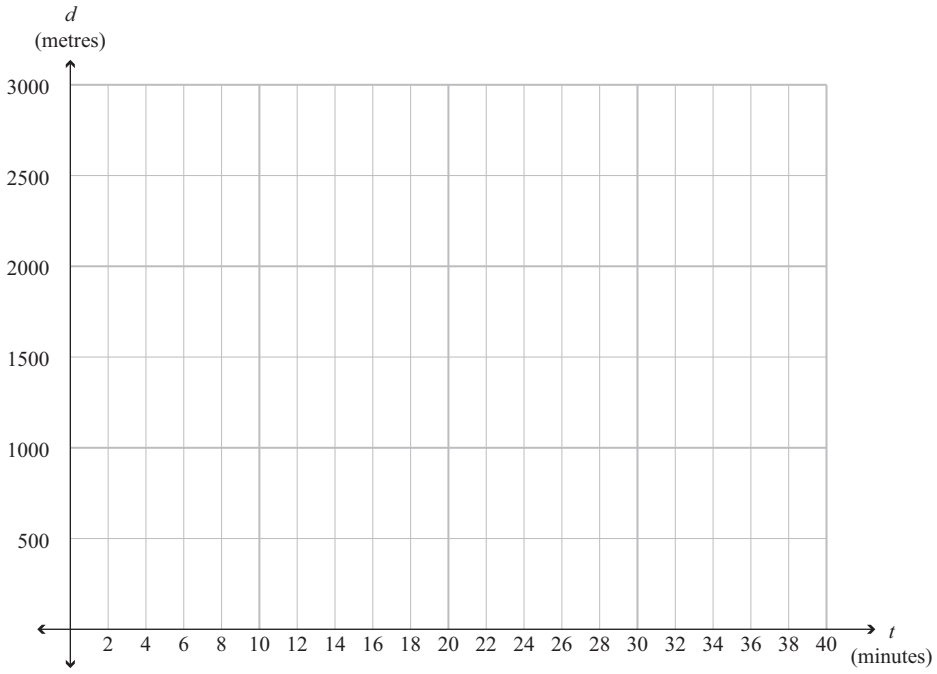
(a) Susie rides her bike to her friend's house at a constant speed.

They then walk to school together at a constant speed.

The distance that Susie is from school is given in the table below.

Susie	**Time *t* since leaving home in minutes**	**Distance *d* from school in metres**
Leaves home		2500
Arrives at friend's house	2	2000
Leaves friend's house	15	2000
Arrives at school	35	

(i) On the axis below sketch the graph of the distance, d, that Susie is from school at any time, t minutes after leaving home.



If you need to redraw this graph, use the grid on page 17.

(ii) For your graph give the equation to find how far Susie and her friend are from school at any time for:

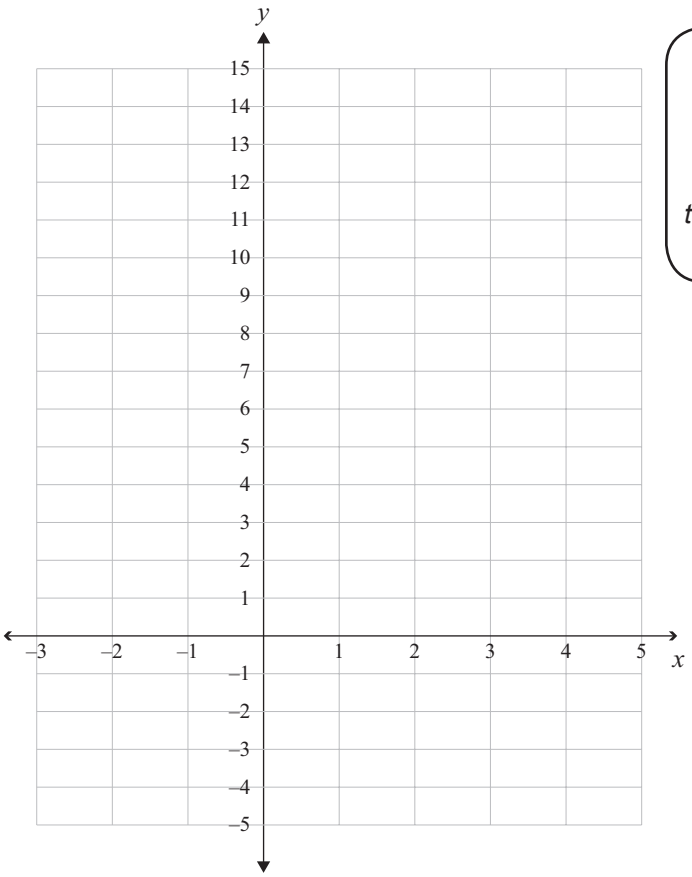
- $2 \le t \le 15$

- $15 < t < 35$

(b) Kei te waihanga papatau tau a Charne.

MĀ TE KAIMĀKA ANAKE

x	Y
–2	5
–1	0
0	–3
1	–4
2	–3
3	0
4	5
5	12



Ki te hiahia koe ki te tuhi anō i tēnei kauwhata, whakamahia te tukutuku i te whārangi 16.

(i) Ki te tukutuku i runga ake tuhia te kauwhata o te pānga e whakaaturia ana i roto i te papatau.

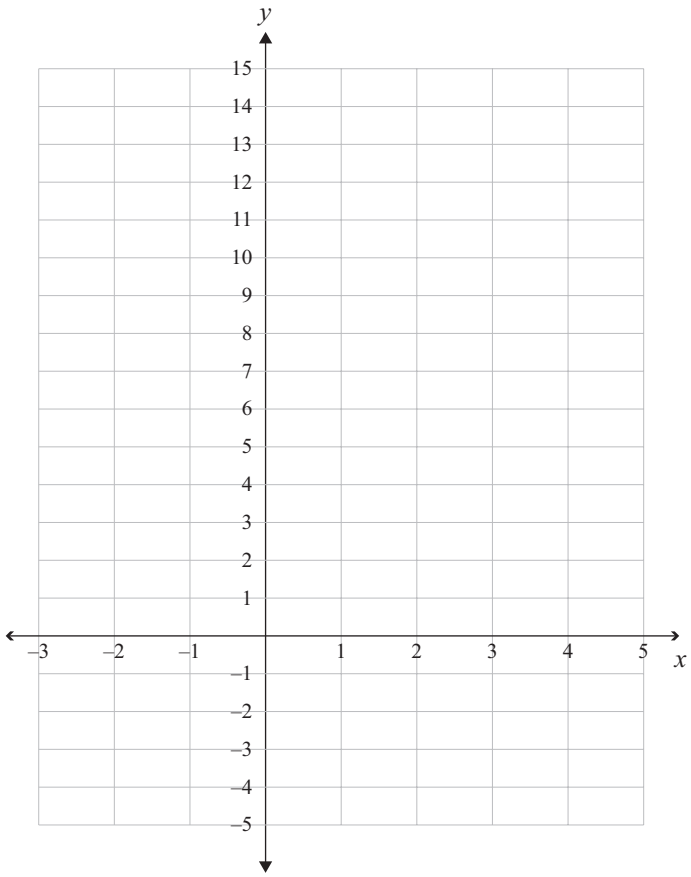
(ii) Homai te whārite i whakamahia e ia kia riro mai ai ko ēnei tau.

(iii) Mēnā i nekehia te kauwhata kia noho ai ko te pūwāhi iti rawa he (3,–1), whakaahuahia ka pēhea te huri o te kauwhata, ka homai i te whārite hou o te kauwhata.

ASSESSOR'S USE ONLY

(b) Charne is making tables of numbers.

x	y
–2	5
–1	0
0	–3
1	–4
2	–3
3	0
4	5
5	12



If you need to redraw this graph, use the grid on page 17.

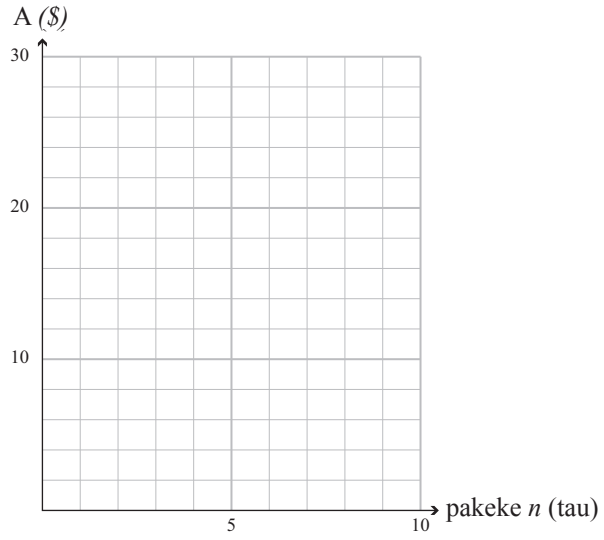
(i) On the above grid plot the graph of the relationship shown in the table.

(ii) Give the equation that she would have used to get this set of numbers.

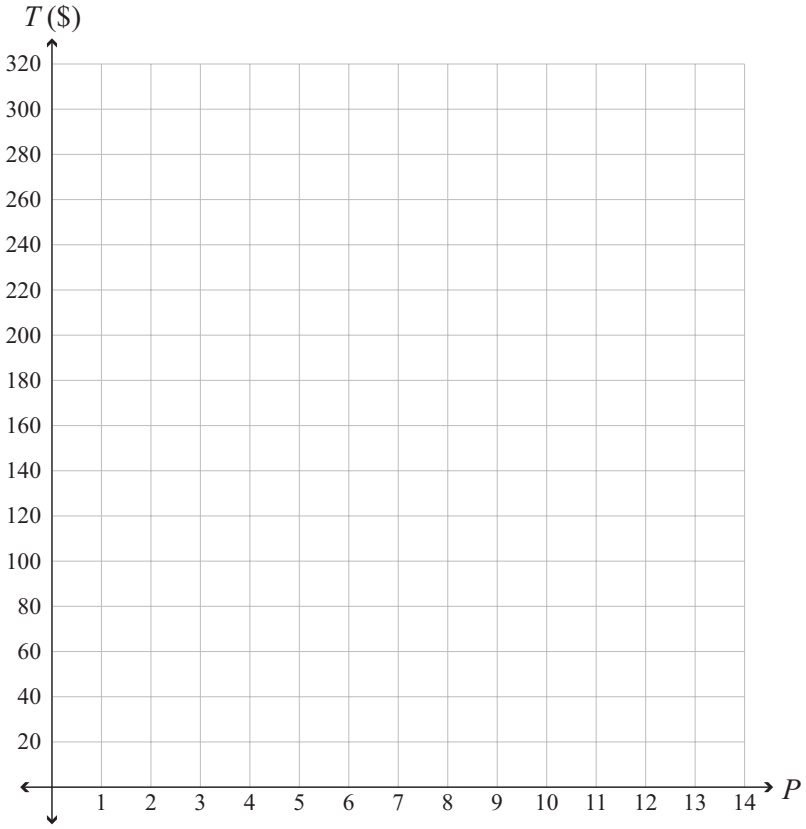
(iii) If the graph was moved so that its lowest point was at (3,–1), describe how the graph would change, and give the new equation of the graph.

MĀ TE KAIMĀKA ANAKE

Ki te hiahia koe ki te tuhi anō i te kauwhata mai i te Pātai Tuatahi (a)(iii), tuhia ki te tukutuku o raro. Kia mārama te tohu ko tēhea te kauwhata ka hiahia koe kia mākahia.

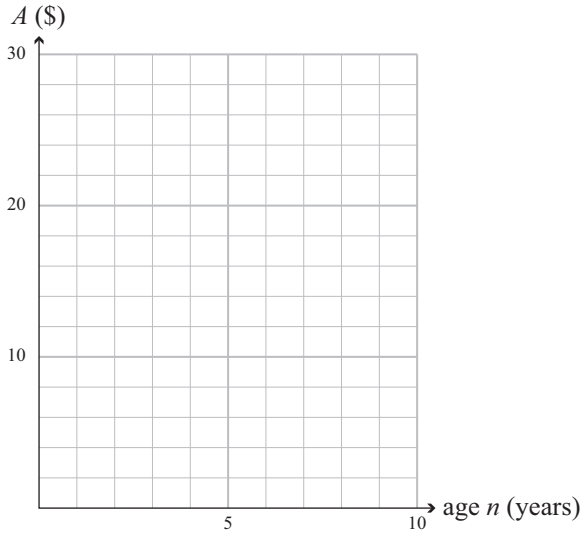


Ki te hiahia koe ki te tuhi anō i tēnei kauwhata mai i te Pātai Tuarua (a)(i), tuhia ki te tukutuku o raro. Kia mārama te tohu ko tēhea te kauwhata ka hiahia koe kia mākahia.

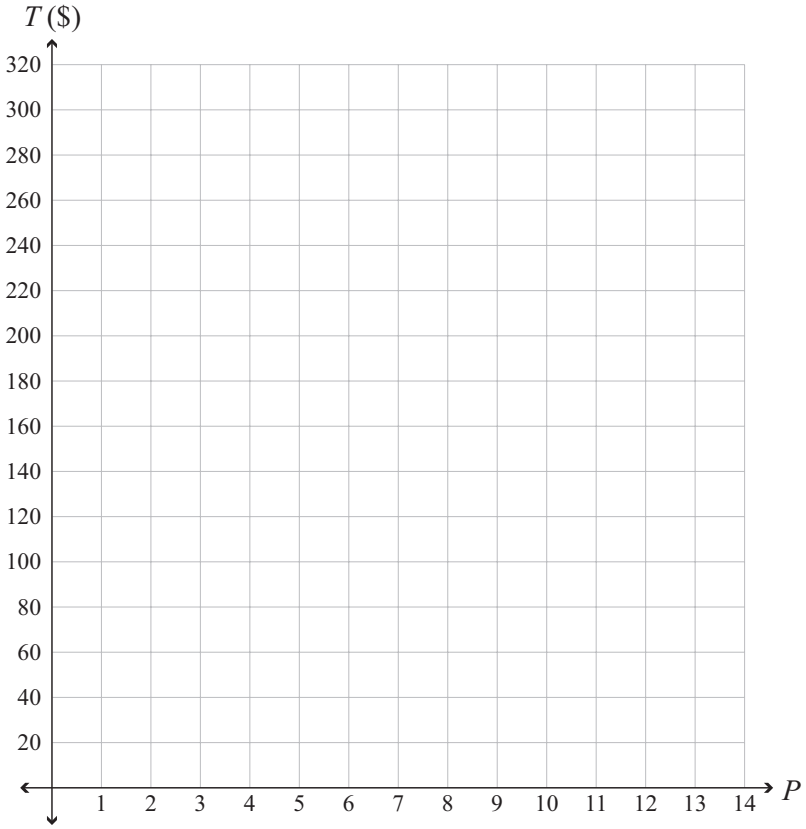


ASSESSOR'S USE ONLY

If you need to redraw the graph from Question One (a)(iii), draw it on the grid below. Make sure it is clear which graph you want marked.

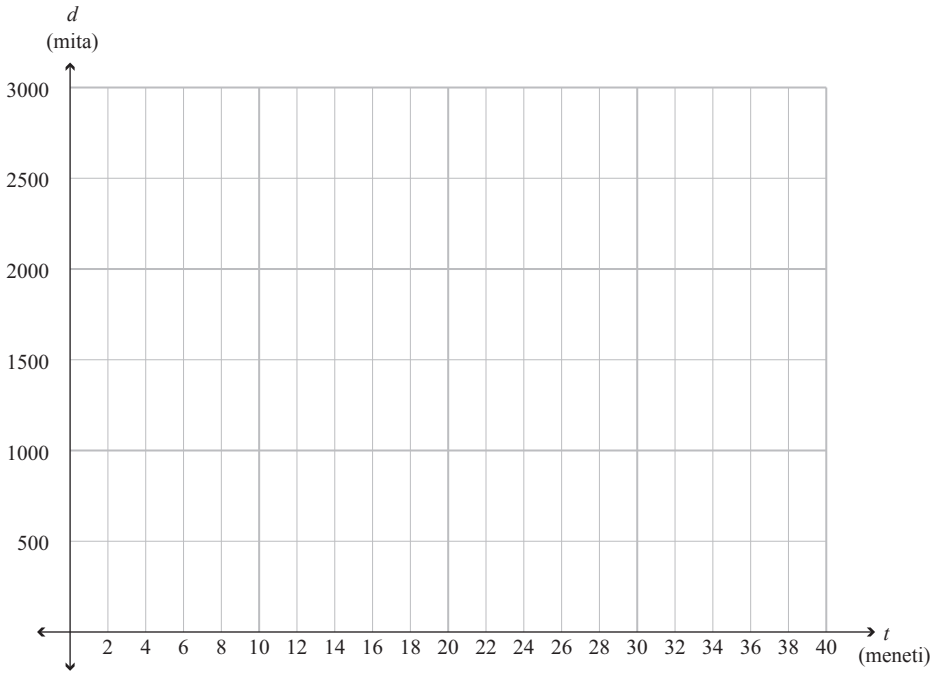


If you need to redraw the graph from Question Two (a)(i), draw it on the grid below. Make sure it is clear which graph you want marked.

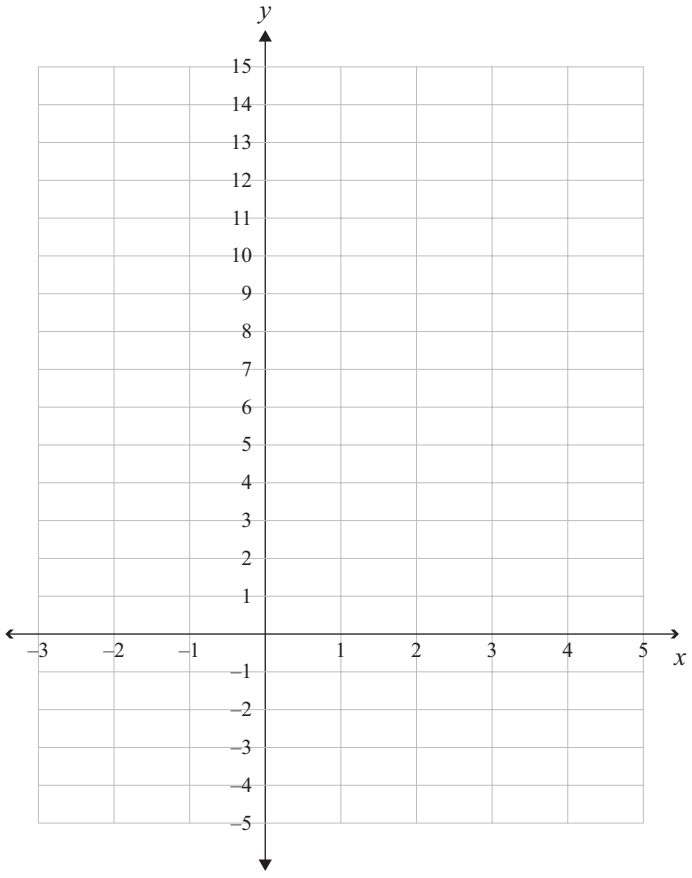


Ki te hiahia koe ki te tuhi anō i tēnei kauwhata mai i te Pātai Tuatoru (a)(i), tuhia ki te tukutuku o raro. Kia mārama te tohu ko tēhea te kauwhata ka hiahia koe kia mākahia.

MĀ TE KAIMĀKA ANAKE

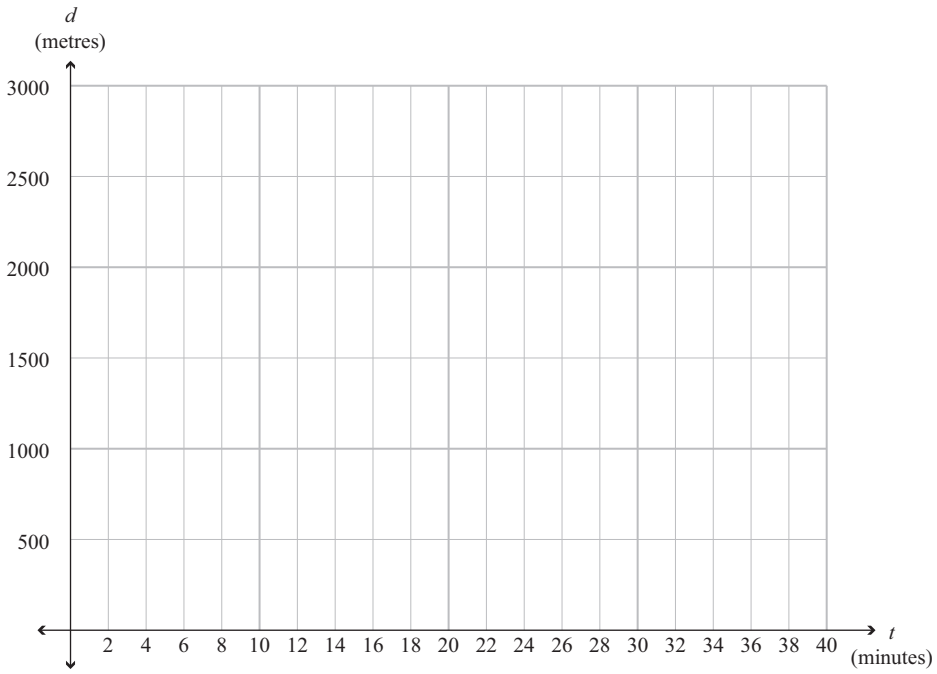


Ki te hiahia koe ki te tuhi anō i te kauwhata mō te Pātai Tuatoru (b), tuhia ki te tukutuku i raro. Kia mārama te tohu ko tēhea te kauwhata ka hiahia koe kia mākahia.

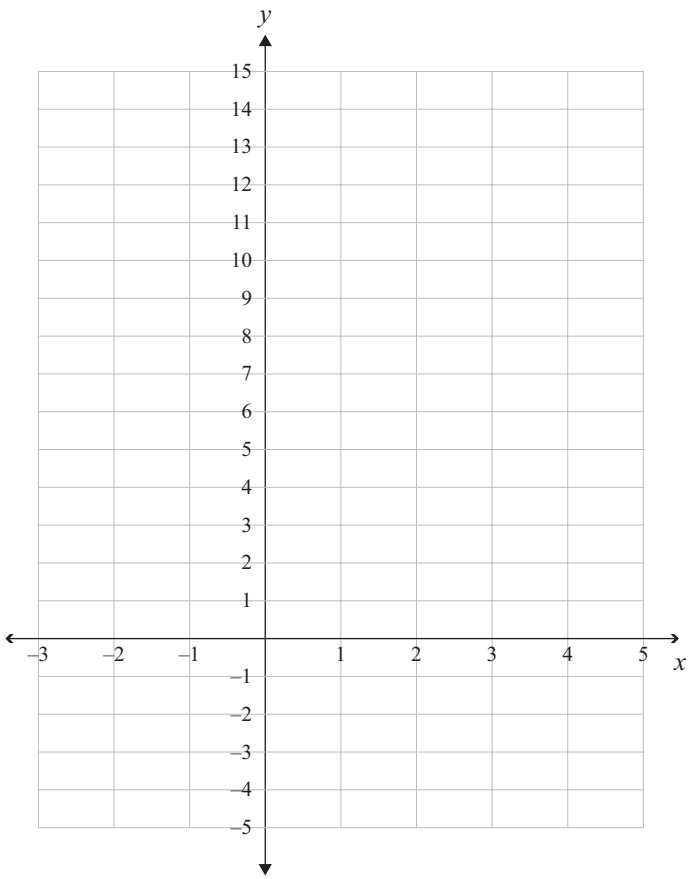


ASSESSOR'S USE ONLY

If you need to redraw the graph from Question Three (a)(i), draw it on the grid below. Make sure it is clear which graph you want marked.



If you need to redraw the graph from Question Three (b), draw it on the grid below. Make sure it is clear which graph you want marked.



He puka anō mēnā ka hiahiatia.
Tuhia te (ngā) tau pātai mēnā e hāngai ana.

TAU PĀTAI

MĀ TE KAIMĀKA ANAKE

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

English translation of the wording on the front cover

Level 1 Mathematics and Statistics, 2013

91028 Investigate relationships between tables, equations and graphs

9.30 am Wednesday 13 November 2013
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Investigate relationships between tables, equations and graphs.	Investigate relationships between tables, equations and graphs, using relational thinking.	Investigate relationships between tables, equations and graphs, using extended abstract thinking.

91028M

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 attempt ALL the questions in this booklet.

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 2–19 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.