

Part C

The contents of this test paper must remain *confidential* until June 30, 2007.

After each question the maximum total number of points possible for your solution is shown. For example (2/1) indicates that the question can give a maximum of 2 g-points and 1 vg-point. You may demonstrate MVG-qualities in your solutions to questions marked with the symbol α .

Complete solutions are required for almost all questions.

Merely stating the correct answer does not give any points except for the questions marked *Only answer is required*.

Your solution must be clear enough so that other persons may easily read and understand what you mean. It is important that you present all your work. You may get some points, even for a partial solution.

Aids: Calculator, ruler and formula sheet.

Time: 100 minutes.

Name: _____

School: _____ Class: _____

Birth date: Year _____ Month _____ Day _____

Female ☐ Male ☐

Solutions and answers must be written on separate paper, not on this question paper. The question paper must be handed in, together with your solution.

New Zealand

1. The table shows the distances in kilometres between some places in New Zealand.

	Dunedin	Greymouth	Haast	Mt Cook	Nelson	Picton	Queenstown	Te Anau	Wanaka
Dunedin		616	424	329	799	711	299	299	276
Greymouth	616		308	525	296	360	567	714	456
Haast	424	308		360	604	717	187	359	148
Mt Cook	329	525	360		737	672	271	499	212
Nelson	799	296	604	737		113	917	986	649
Picton	711	360	717	672	113		829	1000	762
Queenstown	299	567	187	271	917	829		186	71
Te Anau	299	714	359	499	986	1000	186		231
Wanaka	276	456	148	212	649	762	71	231	

- a) How far is it from Haast to Te Anau? *Only answer is required.* (1/0)
- b) According to tourist information it takes 7 hours to drive from Haast to Te Anau. What is the average speed in that case? (2/0)

2. Daniel and Sara, who are holidaying on New Zealand, are going to rent a car. They expect to drive about 2 000 km in 10 days. They can choose between the following two alternatives.

Alternative A: 180 NZD per day,
and unlimited kilometres.

Alternative B: 110 NZD per day and in addition,
0.5 NZD per kilometre.

In New Zealand
the currency is
dollars, with the
abbreviation NZD.

Which alternative should they choose? Explain
your answer with reasoning and calculations.

(2/0)

3. The kiwi bird lays only one egg that can weigh 500 g. That is about one fifth of the bird's normal weight. This is a record among birds. How much does a kiwi bird weigh?



(2/0)

4. In New Zealand you can pan for gold. One day there were 12 people panning for gold. After one hour they weigh how much gold they had panned per person. The results are shown in the table.

0.15 g	2.96 g	0.23 g	0.62 g	0.43 g	0.36 g
0.16 g	0.28 g	0.32 g	0.19 g	0.26 g	0.30 g

- a) Find the mean and the median for the amount of gold panned in one hour. (2/1)
- b) Explain why there is such a great difference between the median and the mean. (0/1)

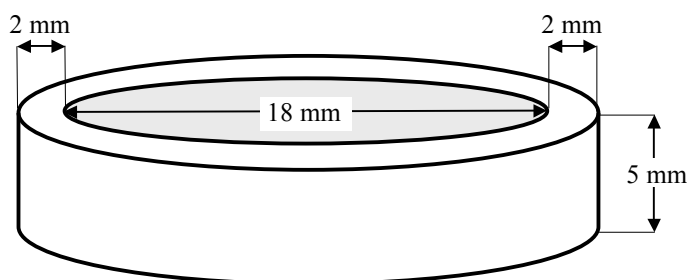
5. In 1872 the world's largest gold nugget "Holtermann's Nugget" was found. It weighed about 285 kg and contained 214 kg of pure gold. The price of gold today is 135 kr/g. How much would this gold nugget be worth today?



Source: Mitchell Library, State Library of New South Wales.

(2/0)

6. Daniel and Sara are panning for gold for Sara's engagement ring. The ring is to be 5 mm wide and 2 mm thick and have an inner diameter of 18 mm.



- a) Find the volume of Sara's ring. (1/2) ✖
- b) How many grams of pure gold must they pan for Sara's ring if it should contain 75 % pure gold? 1 cm³ of gold weighs 19.32 g. (1/1)

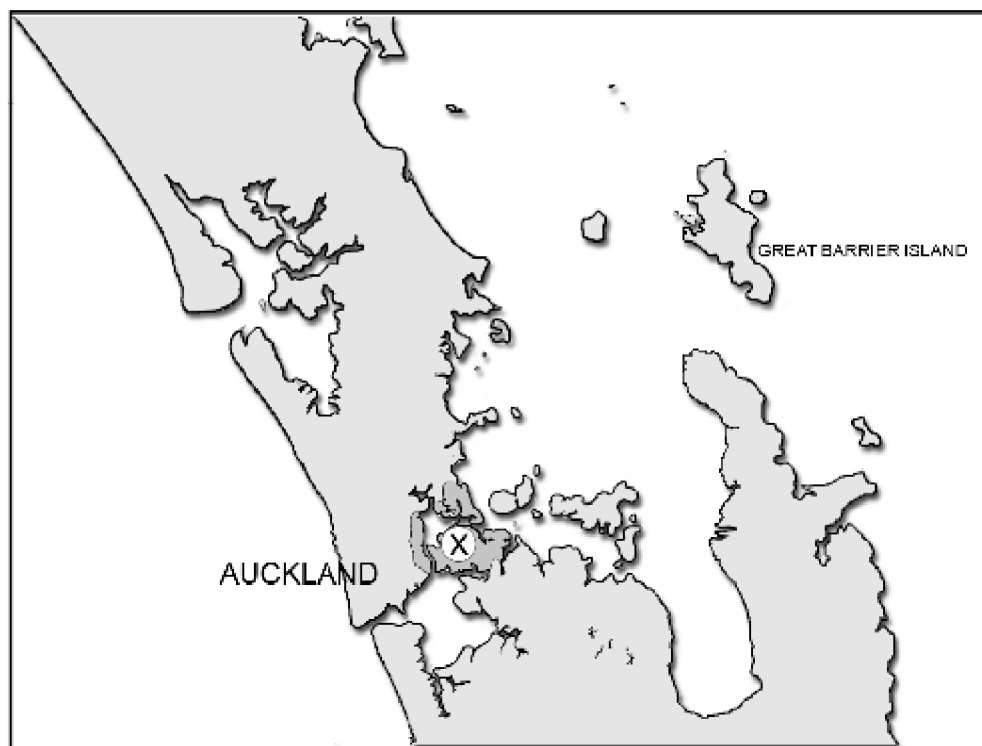
7. Sara is going to call home to Sweden on her cell phone. Her telephone charge can be calculated with the formula $K = 9.95 + 1.6x$ where K is the cost in kr and x is the duration of the call in minutes. How long can she talk for 20 kr? (1/1)

8. In Auckland in New Zealand there is a building called Sky Tower. The tower is 328 m high and it is the highest building in the southern hemisphere.

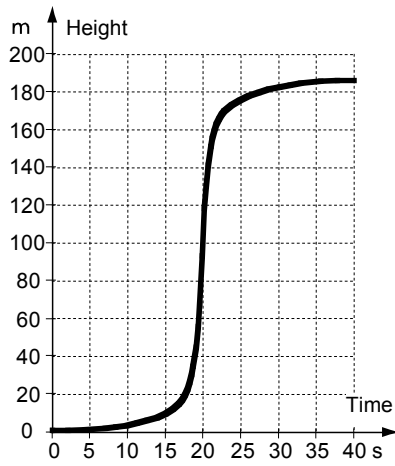
- a) An observation deck “Main observation level” is located at a height of 186 meters. There are 1 029 steps up to this level. Every year there is a contest to climb these steps as fast as possible. The standing record is 5 min 7 s. How many steps did the record winner take every second? (2/0)

- b) According to a tourist brochure you can see as far as 82 km from the highest look-out point on the Sky Tower (the tower is marked with an X). Would it be possible to see the island called Great Barrier Island? (1/1)

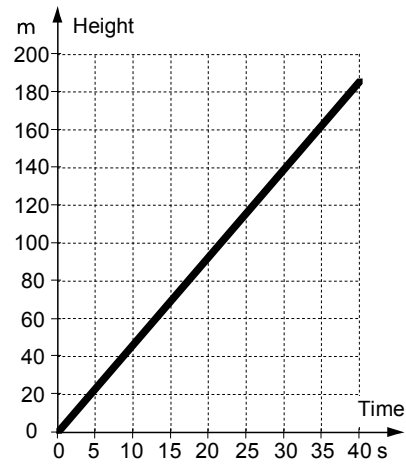
The map is drawn in the scale 1 : 1 500 000



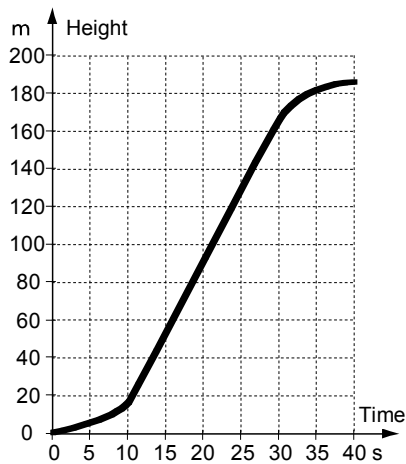
- c) It takes 40 s to ride the elevator up to the deck at 186 m. The top speed of the elevator is 30 km/h. Which of the graphs A, B, C or D shows the relationship between the time and the position of the elevator? Explain your reasoning and/or calculations.



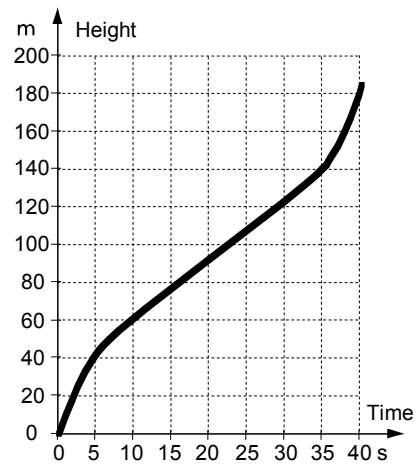
A



B



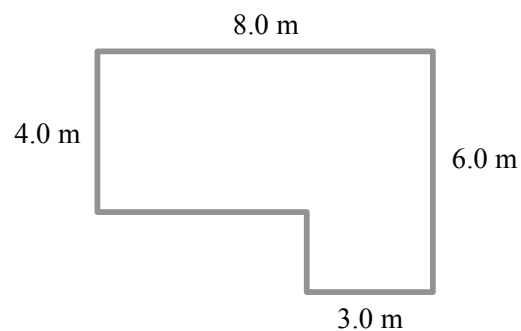
C



D

(0/2) ✖

9. On the west coast of New Zealand it rains a lot. In that region there is about 7 500 mm of rainfall per year. A family collects the rain water that falls on the roof of their house for use in the household. You can see the dimensions of the roof on the drawing. How much water can the family collect in one year?



(1/2)



Photo: H Pettersen

10. In the 18th century 75 % of New Zealand's surface area was covered by virgin forest. Since then much of this virgin forest has been cut down to make way for farming and towns. Virgin forests cover today only about 20 % of the area of the land. How large part of the virgin forests from the 18th century has been cut down?

(1/2) ✕

11. In the middle of the 19th century 300 opossum animals were taken to New Zealand from Australia. Since these animals had no natural predators on New Zealand, their numbers have increased rapidly since then. The table shows the recent development of this population.

Year	Number of opossum
1980	17 million
2005	76 million
2010	

- a) By what percentage did the number of animals increase from 1980 to 2005?
- b) It is expected that the opossum population will continue to increase by about 6 % per year. About how many opossum animals will there be in the year 2010?

(1/1)

(1/2) ✕