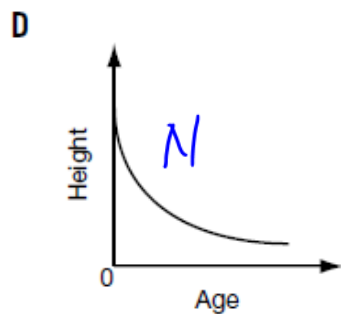
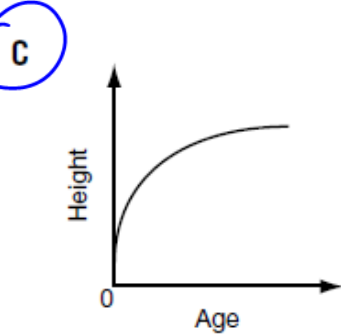
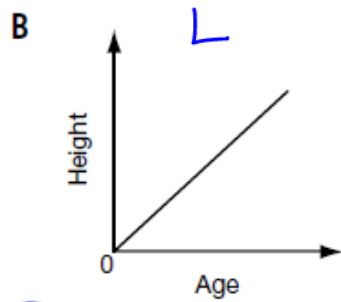
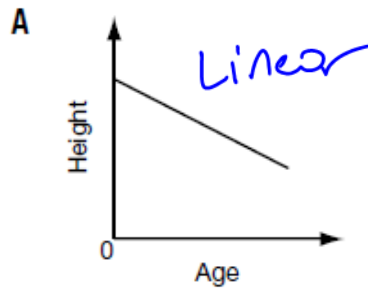


Multiple Choice # 1 - 8

1. Nicole measures the heights of children at a child care centre and finds that the height of a child increases non-linearly as the child's age increases.

Which graph represents Nicole's findings?



2. Soheila needs to calculate the first differences for the relations below. Which relation will she find is **linear**?

a

Time (in hours)	Distance (km)	First differences
3	10	?
4	100	?
5	1000	?
6	10000	?

Handwritten notes: $+1$ () $\times 10$, $+1$ () $\times 100$, $+1$ () $\times 1000$, $+1$ () $\times 10000$

b

Time (in hours)	Distance (km)	First differences
1	25	?
2	30	?
3	35	?
4	45	?

Handwritten notes: $+1$ () $\times 5$, $+1$ () $\times 5$, $+1$ () $\times 10$

c

Time (in hours)	Distance (km)	First differences
3	20	?
5	30	?
7	40	?
9	60	?

Handwritten notes: $+2$ () $\times 10$, $+2$ () $\times 10$, $+2$ () $\times 20$

d

Time (in hours)	Distance (km)	First differences
10	60	?
8	55	?
6	50	?
4	45	?

Handwritten notes: -2 () $\times 5$, -2 () $\times 5$, -2 () $\times 5$

3. Gerry has a table of values representing a linear relation. Two of the numbers are hidden behind a ketchup spill.

x	y
-2	-6
-1	2
0	10
1	18

$$m = \frac{18 - (-6)}{1 - (-2)} = \frac{24}{3} = 8$$

The values that are hidden are

- a -2 and 14.
- b 0 and 12.
- c 2 and 10.**
- d 3 and 9.

4. Inez created the following table of values based on a relationship between x and y and calculated the first differences. The values of y have been concealed.

x	y	First differences
11		-3
12		-3
13		-3
14		-3

Which statement describes the relationship between x and y ?

- a** y decreases linearly as x increases
- ~~b~~ y increases non-linearly as x increases
- ~~c~~ y decreases non-linearly as x increases
- ~~d~~ y increases linearly as x increases

5. The equation for the fees of a taxi company can be represented with the equation $C = 5 + 0.25k$, where C is the cost for the cab ride, and k is the number of kilometers travelled. Which of the following is true?

- a The taxi cab charges an initial fee of \$2.50 and then 5 cents per km driven.
- b The taxi costs \$14.90 for 38km.
- c This is a direct variation. *Partial*
- d** The slope of the relation is $\frac{1}{4}$.

$$0.25 = \frac{1}{4}$$

6. The total cost, C , in dollars, of running an advertisement in a newspaper is made up of an initial cost of \$12, plus a charge of \$5 per day, where n represents the number of days.

Which equation represents this relationship?

- a $C = 12n + 5$
- b** $C = 12 + 5n$
- c $C = (12 + 5)n$
- d $C = 12 + 5 \div n$

$$C = 5d + 12$$

\downarrow rate

7. Sergio sells 7 models of CD players. The table shows the unit cost of each model and the number of CD players of that model sold in the past month.

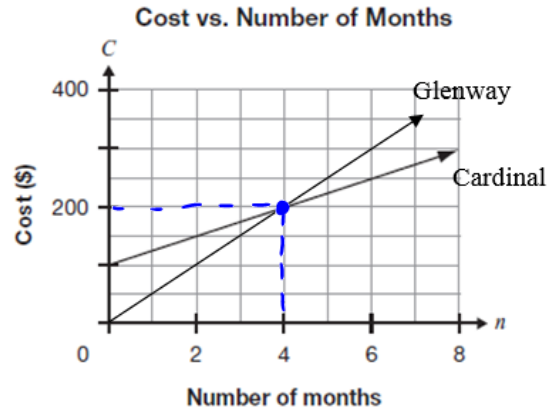
Model	Unit cost (\$)	Number sold
A	55	11
B	70	14
C	90	17
D	100	21
E	120	24
F	150	29
G	200	41

Which statement about the relationship between the unit cost and the number of CD players sold is true?

- a There is no relationship between the unit cost and the number sold.
- b As the unit cost increases, the number sold decreases.
- c As the unit cost increases, the number sold is constant.
- d** As the unit cost increases, the number sold increases.

Increasing
Increasing

8. The graph shows the cost of having a membership at two local country clubs, over time, in months.



Which of the following is true about the costs of these clubs?

- A Glenway is always cheaper because they don't have any initial fees **F**
- B Cardinal is always cheaper because their rate of change is lower **F**
- C If you plan to join for more than 4 months, you should join Cardinal for better value **T**
- D If you plan to join for more than 4 months, you should join Glenway for better value

9. In the morning, Sylvie left home to go to school. The graph below shows her distance from home versus time.



Which sequence of events below is best represented by the graph?

- A** She runs for several minutes. Then she tires and walks instead.
- B She walks for several minutes. Then she turns around and goes home. **X**
- C She walks for several minutes. Then she stops to chat with a neighbour. **X**
- D** She walks for several minutes. Then she sees Ken ahead and runs to meet him. **X**

10. Natasha works for a computer company. The table shows her annual salary in the last five years.

Year	Annual salary (\$)
1	32 000
2	33 600
3	35 200
4	36 800
5	38 400
6	40 000
7	41 600
8	43 200

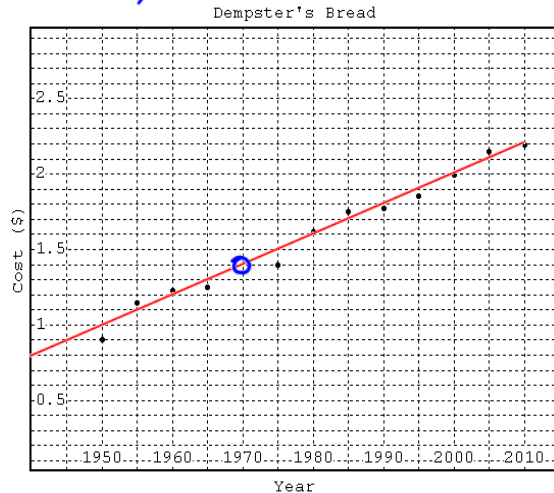
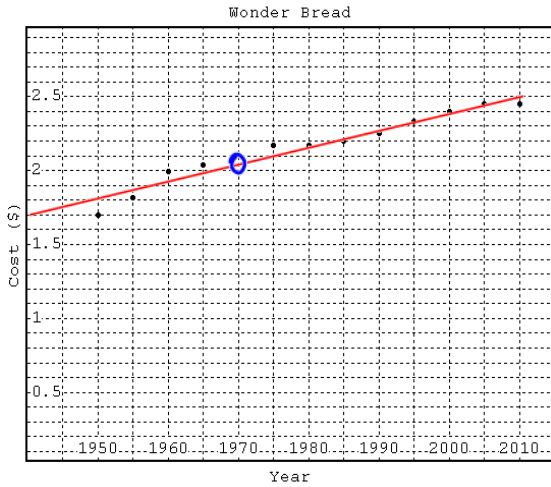
If the trend continues, what will Natasha's annual salary be in the 8th year?

- a \$40 000
- b** \$43 200
- c \$46 400
- d \$49 600

OPEN RESPONSE #1

1. The cost of purchasing a loaf of bread has increased over time. The following scatter plots represent the cost of a single loaf of bread over time for two different bread companies.

ANSWERS WILL VARY



- a) Draw a line of best fit for **both** scatter plots.
- b) Using your line of best fit, how much do you estimate Wonder Bread cost in 1970? 2.05
 Did you use interpolation, or extrapolation? interpolation
- c) Describe the correlation of Wonder Breads' graph.
 1) Positive
 2) Strong
 3) Linear
- d) Which line of best fit is steeper?
Dempster's

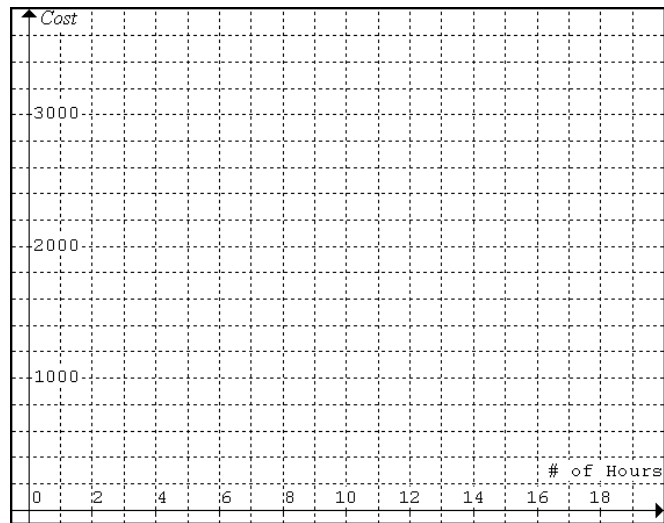
Describe what this steeper slope tells you about how the cost of a loaf of Wonder Bread is changing compared to the cost of a loaf of Dempsters Bread.

- e) An advertisement claims that Wonder Bread will never be a better price than Dempsters.
 Do your scatter plots support this claim? **Give reasons for your answer.**

Open Response Question #2

2. To retain a lawyer ('hire' them to represent you) you have to pay a fixed fee of \$800. After retaining the lawyer the cost per hour is \$120.
- a) Write an equation that represents the relationship between the total cost, C , charged and the number of hours, n , of legal services used.

- b) Create a table of values and graph this relation on the grid below. Include a line of best fit.



- c) Is this an example of direct or partial variation? How do you know?
- d) What is the slope of this relation? What does it represent in this situation?
- e) How many hours of legal service you would receive for \$1460? Be sure to explain, or show how you got your answer.
- f) If you do not retain a lawyer, you would just pay by the hour and the cost per hour is \$180. The cost can be expressed using the equation $C=180h$. How would the graph change if you did not retain a lawyer?

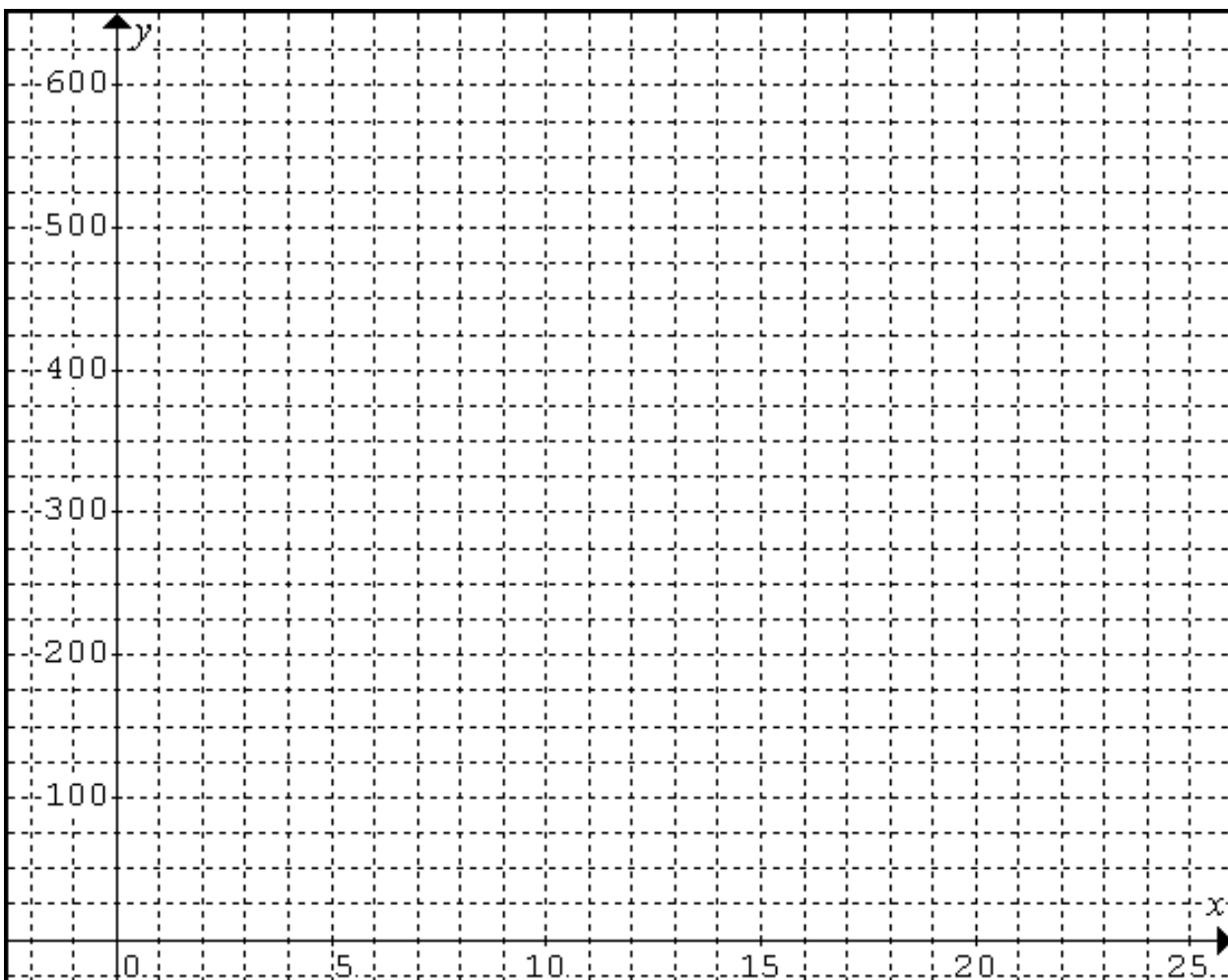
Open Response Question #3

Draw a distance time graph for the following scenario:

Jayne lives at 0m and her school is 600m from her house.

- One morning she leaves for school and **walks** at a steady pace at 50m/min for 4 minutes.
- She stops to talk to her friend Paul for 3 minutes.
- She takes off at a **jog** (75m/min) and keeps up this pace for 3 minutes.
- She realizes that she left her backpack when she was talking to Paul.
- She **jogs** back to where she had left Paul at the same rate she was jogging earlier.
- She grabs her backpack and heads back to school. She walks at a rate of 40m/min as she is tired from all that running.

How long does this trip take her? _____



THINKING QUESTION

Information:

A local gym charges according to the following equation: $F=25m+75$, where F is the fee, and m is the number of months of membership. Another gym is opening up and wants to be competitive. The owner approaches you for suggestions on fee structure.

Your Task:

Suggest two different plans for the new owner, be specific about the costs in each plan and provide the equation given the guidelines below. For each plan you will have to justify your answers with mathematical support (6 marks) to show that your solutions work to achieve these goals (can include tables, graphs, algebraic modelling etc.)

Templates are provided on the back of this page if you want to use them. It is not mandatory or necessary to use any or all of the tools, choose what you would like to use.

First – a plan which will always be cheaper and

Second – a plan that seems cheaper but as time passes is actually more expensive (tricking people to spend more money).

