

Polynomial Function of Degree 0 or 1

1 Which of the following equations are parallel to $y = -2x + 6$?

a) $y = -2x + \frac{1}{3}$

b) $y = 6x - 2$

c) $f(x) = \frac{-4x}{2} + 3$

d) $y = 6x + 3$

e) $f(x) = 3x + 6$

2 An amusement park's entrance fee is \$30, regardless of the number of rides you go on.

a) Construct a table of values for this situation.

Number of rides chosen					
Price (\$)					

b) What do you observe about the entrance fee as a function of the number of rides you go on? _____

c) Describe the curve representing this situation. _____

3 Sophie works in a supermarket and the following rule establishes her salary s as a function of the number of hours h worked: $s = 8h$.

a) Construct a table of values for this situation.

Number of hours worked					
Salary (\$)					

b) What does the rate of change in this situation correspond to? _____

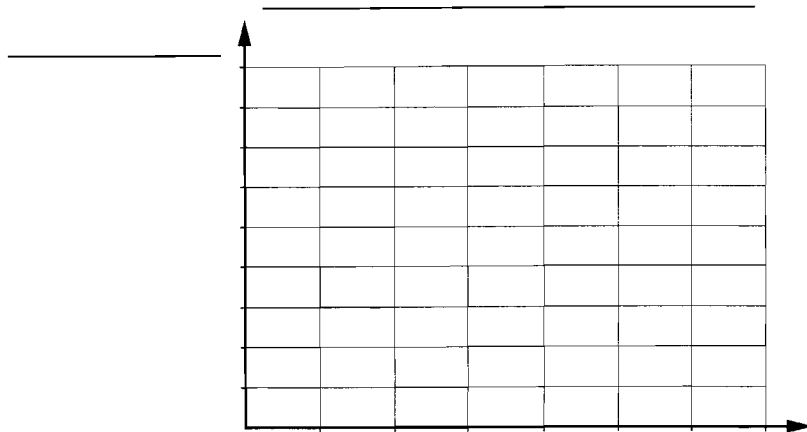
c) Is this a proportional situation? _____

d) Describe the curve representing this situation.

- 4** Philippe is a physiotherapist in a clinic and his weekly salary s (in \$) is determined by the following rule: $s = 15n + 300$, where n is the number of patients he treats every week.

a) What is the rate of change and the initial value in this situation?

b) Draw the graph of this situation.



c) Describe the curve obtained.

d) What will change in the graph and what will the change represent if the rule for calculating his weekly salary is now:

1) $s = 18n + 300$

2) $s = 15n + 350$

- 5** Scientists have established that the following rule f determines the number of times a desert locust chirps per minute as a function of the outside temperature x (in °C): $f(x) = 7x + 90$.

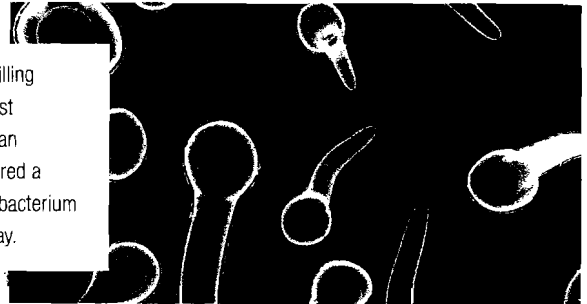
a) Calculate the value of $f(10)$, $f(15)$, $f(30)$ and determine what these values represent in this context.

b) Calculate $f(-10)$ and explain whether this value makes sense in this context.

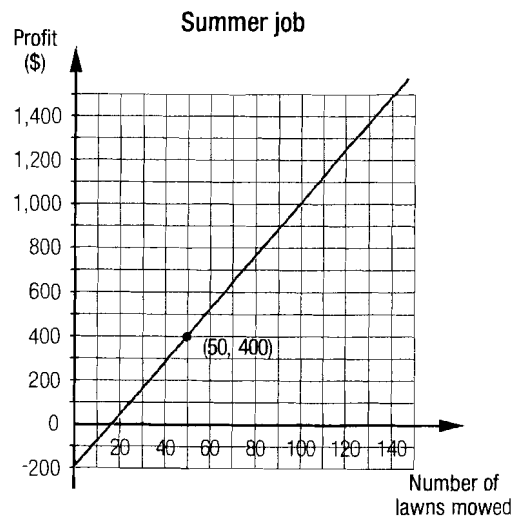
- 12** To attract new members, a tennis club offers the following promotion: \$150 for an annual membership plus \$8/h for each player.
- Determine the rule of the function for calculating the annual cost $C(h)$ (in \$) based on the number of hours h played by a person over the course of the year.
 - What is the total annual cost for a person who plays 27 h over the course of the year?
 - Determine the number of hours played by a person if she paid \$534 over the course of the year.

- 13** The number of bacteria in a culture increases by 150 bacteria/min. If there are 550 bacteria to begin with, how long will it take for their number to triple?

In 2000, while drilling into the permafrost in Alaska, American scientists discovered a 32 000-year-old bacterium that still lives today.



- 14** A student mows lawns during the summer. The graph on the right is a model representing his net profit (in \$) based on the number of lawns mowed.
- What is his profit if he mowed 125 lawns?
 - If his profit is \$2,500, how many lawns did he mow?
 - What is the initial value and what does it represent in this context?
 - What is the constant of the function and what does it represent in this context?



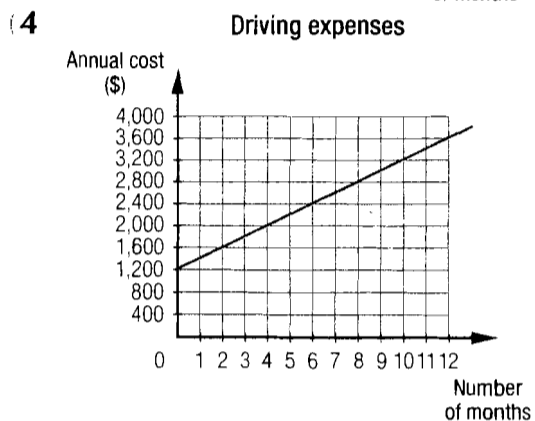
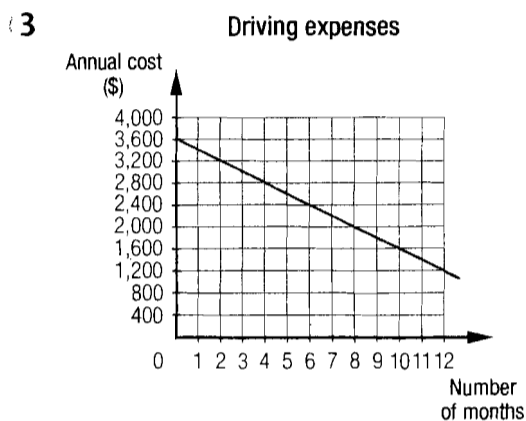
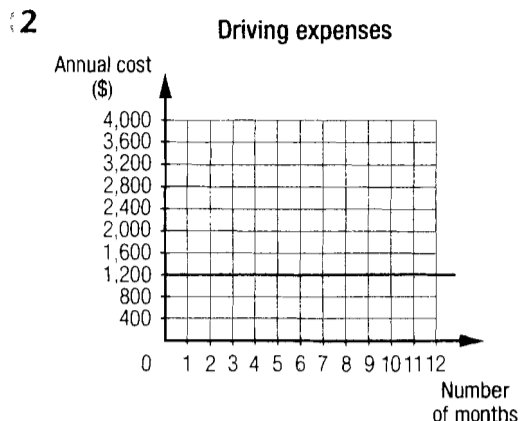
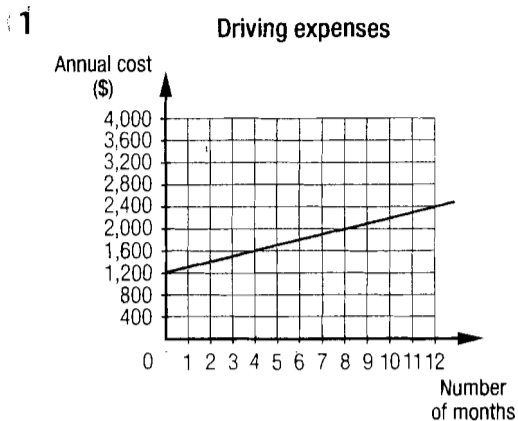
- 15** The sum s collected for a fundraiser depends on the number n of tickets sold. Associate each of the descriptions below with the corresponding rule.

Description	Rule
(A) Each ticket sells for \$5 and the expenses are \$120.	1 $s = 5n$
(B) Each ticket sells for \$5 and one person makes a \$120 donation.	2 $s = 120n$
(C) Each ticket sells for \$5.	3 $s = 5n - 120$
(D) Each ticket sells for \$5 and the organizing committee draws a \$130 door prize.	4 $s = 5n + 120$
	5 $s = 5n + 130$
	6 $s = 5n - 130$
	7 $s = 120n + 5$
	8 $s = 120n - 5$
	9 $s = 130n - 5$

16 The annual cost of using a given car can be calculated based on the following information:

- a fixed annual sum (driver's licence, \$43; registration, \$255; insurance, \$902)
- monthly expenses (maintenance and repairs, \$75; gas, \$125)

a) Which of the graphs below describes this situation?



b) You can also pay automobile insurance in 12 monthly payments. Construct the graph corresponding to this new situation.

c) For each of the cases in a) and b), determine the rule establishing the annual cost c of using a car (in \$) based on the number of months m that the car is used in a given year.

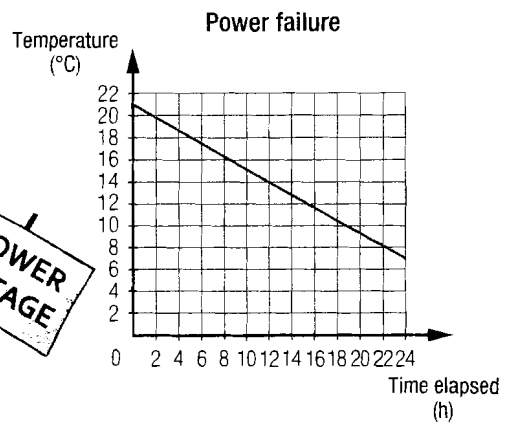
The first automobile was built in 1769 by a French military engineer. He invented a three-wheeled vehicle equipped with a steam engine, which could reach speeds of 3.5 to 4 km/h.



17 At a photo lab, Zoé paid \$7.30 to develop a 12-exposure film, while Toby paid \$14.50 to develop a 30-exposure film. If the cost of printing each photo is identical, determine the rule establishing the total amount a paid (in \$) based on the number of photos p developed.

18 The graph on the right shows the relation between the time elapsed since the beginning of a power failure in winter and the ambient temperature in a house.

- Determine the rule describing this relation.
- What are the coordinates at the origin of the line?
- At 5°C , during a power failure, it is recommended to drain all of the pipes in the house in order to prevent them from bursting. How much time after the beginning of the power failure should the owners of this house drain their pipes?



19 A small company specializes in pool maintenance. Complete the table of values below knowing that the hourly rate is constant.

	Pool Pal				
Time (h)	2	5	8	10	
Rate (\$)	55	100	145		205

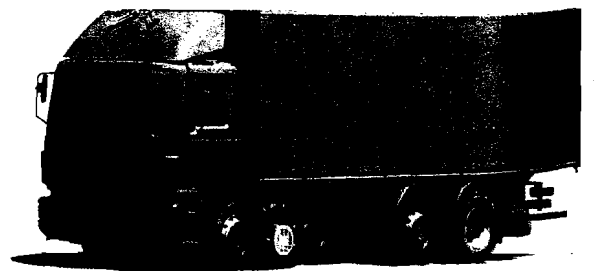
20 A person opens a bank account and deposits \$445.21. Then, she deposits \$26.53 every week.

- How much money will she have in her account after one year?
- How long will it take her to:
 - save \$1,267.64?
 - more than double her initial deposit?

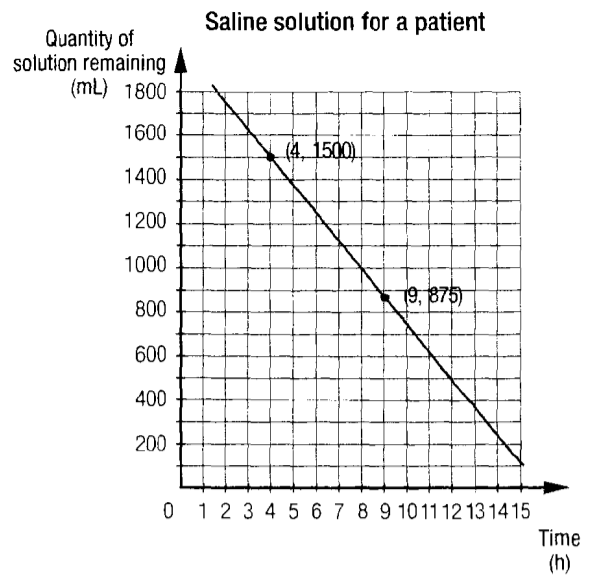
The first Canadian penny was struck in 1858. Slightly larger than today's quarter, it bore the image of Queen Victoria.

21 **VEHICLE LOADING STANDARDS** In Québec, the maximum allowable mass of a loaded tractor-trailer is 25 250 kg. The total mass of a truck carrying 150 boxes is 23 790 kg. If the truck carries 171 boxes, its total mass is 24 199.5 kg. All of the boxes have the same mass.

- What is the mass of the truck without its load?
- What is the mass of one of the boxes?
- What is the maximum number of boxes the truck can carry while still respecting Québec's vehicle loading standards?

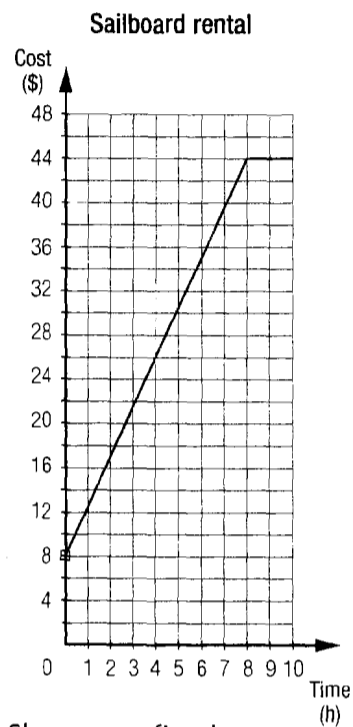


- 22** In a hospital, a patient is given a physiological saline solution. The graph on the right indicates the quantity of solution remaining as a function of time. Determine the rule of this function.



- 23** A printing shop charges \$355 to print 1000 flyers and \$372.50 to print 1250 flyers. If the unit cost of a flyer is constant, how much will it cost to print 1875 flyers?

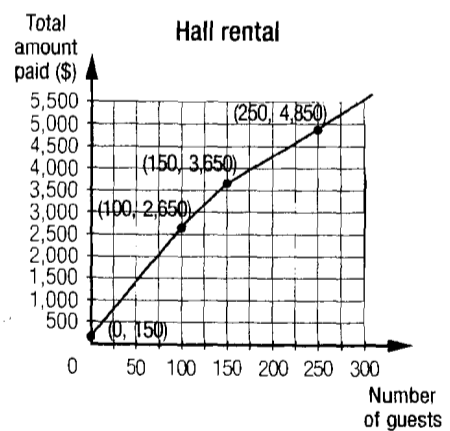
- 24** The graph on the right indicates the cost of renting a sailboard as a function of the number of hours.



- What is the maximum rental fee?
- How much does it cost to rent the sailboard for:
 - 4 h?
 - 9 h?
- If you pay \$35 in rental fees, for how long will you be able to use the sailboard?
- What does it cost to rent a sailboard for 2 h 15 min?

- 25** Josie wants to rent a hall for her wedding next summer. She pays a fixed amount to rent the hall and another amount for each guest. The graph below provides information about the situation.

- How much does it cost to rent the hall?
- If Josie is inviting 269 guests, how much will she have to pay?



Since 2001, approximately 22 000 weddings have been celebrated each year in Québec. This number represents 15% of all weddings celebrated in Canada.