Name: _____

Group: _____ Date: _____

ACTIVITY 1 4.4

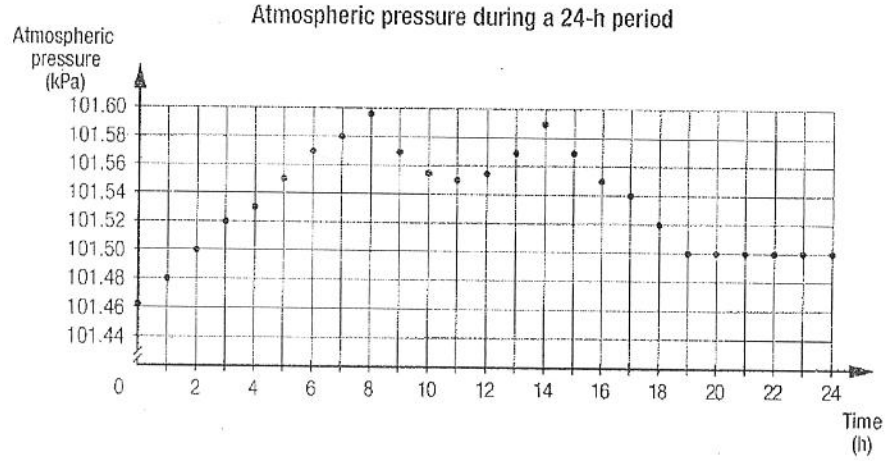
Student Book, p. 49

What's to come?

Weather forecasts are possible through interpretation of satellite images, radar images and data collected from a vast network of weather stations. The data collected by these stations include temperature, relative humidity, atmospheric pressure, wind speed and direction.

The study of variations in atmospheric pressure allows meteorologists to track weather systems such as atmospheric lows that cause bad weather.

The graph below shows the atmospheric pressure recorded at the same location during the course of one day.



a. The scatter plot representing this situation is made up of distinct parts. What type of function can you associate with each of the following intervals?

1) [0, 8] h _____ 2) [8, 14] h _____

3) [14, 19] h _____ 4) [19, 24] h _____

b. What type of function can you associate with this situation?

_____

c. Draw the curve which best fits each segment of the function.

d. According to the model obtained in **c.**, determine the atmospheric pressure at:

1) 2:30 a.m. _____ 2) 8:25 a.m. _____

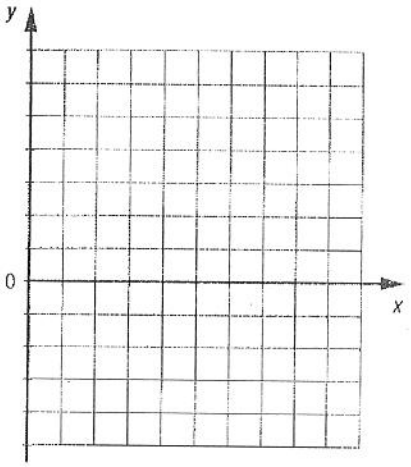
3) 2:45 p.m. _____ 4) 6:15 p.m. _____

Name: _____

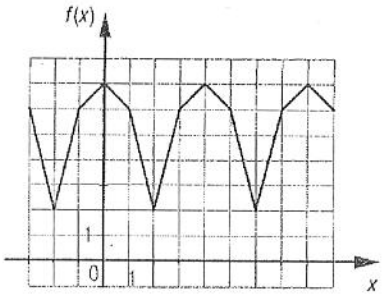
Group: _____ Date: _____

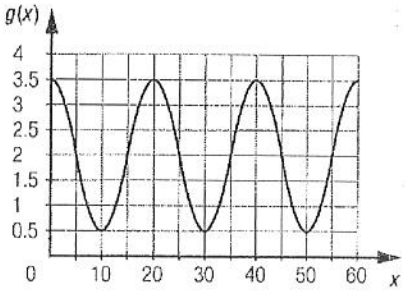
2 In the adjacent Cartesian plane, draw the following piecewise function.

Interval	Rule
[0, 5]	$f(x) = 0.5x^2$
[5, 8[	$f(x) = 12.5$
[8, 15[	$f(x) = -x + 5$



3 Below are two periodic functions:





a) Determine period P for:

$f(x)$ _____ $g(x)$ _____

b) Use the graphical representations to determine the value of:

1) $f(1)$ _____ $f(3 + P)$ _____ $f(3 - P)$ _____

2) $g(5)$ _____ $g(5 + P)$ _____ $g(5 + 2P)$ _____

c) Determine the value of:

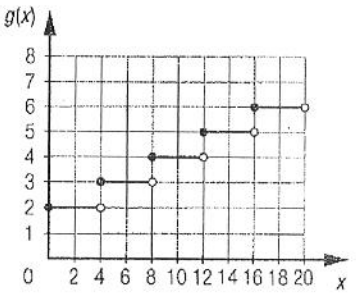
1) $f(17)$ _____ $f(-11)$ _____ $f(40)$ _____

2) $g(-30)$ _____ $g(105)$ _____ $g(-200)$ _____

4 For the adjacent step function, determine:

a) the range _____

b) the critical values _____



Name: _____

Group: _____ Date: _____

3 A cell phone company offers a calling plan which has a base fee of $24.90 for each month and a calling charge of $0.15 for each minute. There are no charges other than the monthly fee if a user makes phone calls that last less than one minute each month.

a) Draw a graph which represents this situation.

b) What type of function can be used to model this situation?

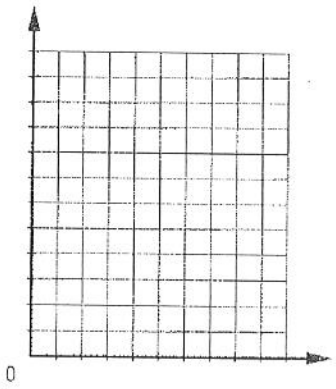
_____

c) What would the cost be for a customer who uses the telephone for 50 min 22 s during the course of a month?

_____

d) How much time does a customer spend on the phone if her monthly phone bill comes to $38.85?

_____



4 The scatter plot below represents Maxime's mountain bike race.

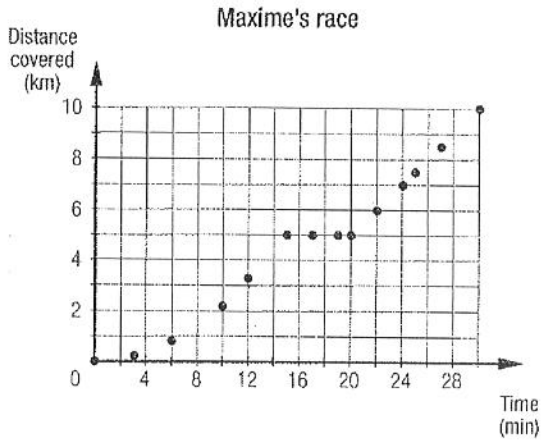
a) What type of function can be used to model this situation? Justify your answer.

_____

_____

_____

_____



b) Draw the curve which best corresponds to each segment of the scatter plot.

c) Complete the table below.

Interval (min)	Distance covered at the end of this interval (km)	Type of function	Rule
	5		
[15, 20[		Zero-degree polynomial	
[20, 30]			$f(x) = 0.5x - 5$

d) How much distance had Maxime covered after:

1) 8 min? _____ 2) 26 min? _____

Name: _____

Group: _____ Date: _____

5 A factory foreman tallies up the number of work-related accidents annually since the factory was opened. He then models this situation using the function represented below.

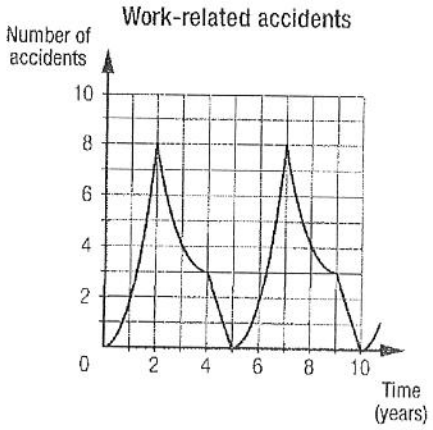
a) Describe this situation.

_____

_____

_____

_____



b) According to this model, how many work-related accidents occurred during:

1) year 10? _____

2) year 12? _____

3) year 24? _____

6 The adjacent table of values provides data about the mean yearly temperature of a region in relation to the number of years since the temperature was first recorded.

Temperature variations

Time (years)	Mean yearly temperature (°C)	Time (years)	Mean yearly temperature (°C)
0	15.5	8	13.5
1	17.2	9	12.0
2	12.1	10	15.3
3	13.2	11	16.9
4	11.9	12	12.2
5	15.6	13	13.0
6	17.5	14	12.1
7	12.2	15	15.5

Predict what the region's mean yearly temperature will be in 35 years. Justify your answer.

_____

_____

_____

_____