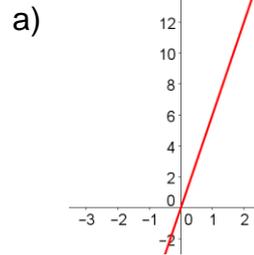


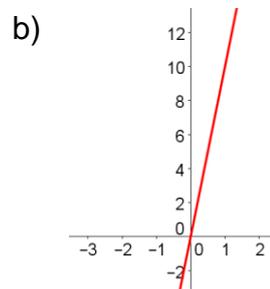
# LINEAR FUNCTION WORD PROBLEMS. MATCHING WORKSHEET

Match each scenario to the graph that represents it. Write the linear function of all the graphs.

1. Isabella drives a car 10 km in a hour.



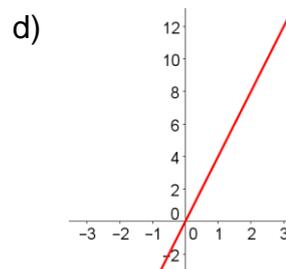
2. When Alexander measured his room temperature. The first time it was 18°C and after one hour it was 20°C.



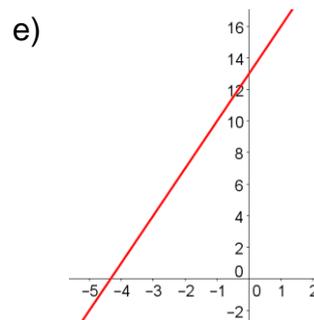
3. Emily runs 6 kilometres in an hour.



4. Tyler measured his car's exhaust pollution. The first time it was 13 parts per thousand and after one week it was 16 parts per thousand.



5. Jennifer walks 4 kilometres in an hour.



## LINEAR FUNCTIONS AS MODELS

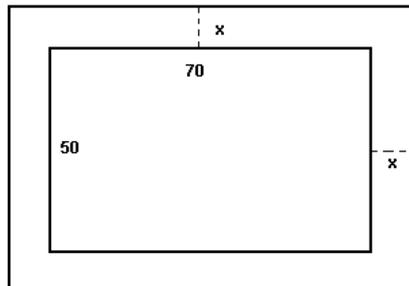
### Goal:

Given a situation in which two real-world variables are related by a straight-line graph, be able to:

- Sketch a graph.
- Write the equation.
- Use the equation to predict values.
- Determine the slope and the intercepts with their meaning in the real world.

### **The outside perimeter:**

A 50-metre by 70-metre rectangular garden is surrounded by a walkway of constant width  $x$  metres.



- Write the outside perimeter  $P$  in terms of  $x$ .
- Plot the graph of this linear function.
- What is the slope of the graph? What does this number represent?

### **The tank of a car:**

A driver starts a journey with 25 gallons in the tank of his car. The car burns 5 gallons for every 100 miles. Assuming that the amount of gasoline in the tank decreases linearly,

- write a linear function that relates the number of gallons  $G$  left in the tank after a journey of  $x$  miles.
- Plot the graph of this linear function.
- What is the value and meaning of the slope of the graph of  $G$ ?
- What is the value and meaning of the  $x$ -intercept?

### Thermal expansion:

Bridges on highways often have expansion joints, which are small gaps in the roadway between one bridge section and the next. The gaps are put there so the bridge will have room to expand when the weather gets hot.

Suppose a bridge has a gap of 1.3 cm when the temperature is 22°C, and that the gap narrows to 0.9 cm when the temperature warms to 30°C. Assume the gap width varies linearly with the temperature.

- Write the particular equation for gap width ( $w$ ) in terms of temperature ( $t$ ).
- How wide would the gap be at 35°C? At -10°C?
- Plot the graph of this linear function. Use a suitable domain and label the horizontal and vertical axis.
- At what temperature would the gap close completely? What mathematical name is given to this temperature?
- What is the width-intercept? What does this tell you in the real world?
- What is the slope? What does this number represent?

### Electricity bill:

Look at this Fina's electricity bill (corresponding to March 2015):

Electricity consumption .....	108 kWh	at 0.14 €/kWh .....	15.12 €
Contracted power (3.450 kW) .....			11.90 €
Meter rental .....			0.80 €
Tax Base .....			27.82 €
VAT 21% .....			5.84 €
		<b>TOTAL:</b>	<b>33.66 €</b>

- Write a linear function that models her monthly electricity bill ( $y$ ) as a function of electricity consumption ( $x$ ). (Use all the decimal digits that you get).
- If the electricity consumption in April was 95 kWh, what would the electricity bill be?
- What is the  $y$ -intercept? What does this number represent in real world?
- What is the slope? What does this number represent?