Functions as Models: Burning Calories

When you run for a certain amount of time, you burn calories.

Dependent Variable: _____
Independent Variable: _____

Function: where C: calories burned
t: time (in minutes)
w: weight (in kg.)
r: rate (speed in km/hour)

1. How long does it take you to run a kilometer? _____

2. So, how many km. can you run in one hour? My rate is: ____ km./hour

3. Simplify the function by substituting in <u>your weight</u> and <u>your rate</u>.
This will be the calorie burning function for YOU personally!

4. Use your function to answer the following questions
AND make a table of values that contains all the data.

Add table here:

a. If you ran for 25 <u>minutes</u>, how many calories would you burn?

b. If you ran for 2 <u>hours</u>, how many calories would you burn?

c. If you ran for 3.4 <u>hours,</u> how many calories would you burn?

5. You ate lots of junk food today so your calorie intake was 2435. The healthy amount of calories you need is 1800. How many minutes would you have to run to burn the excess calories?
Need to burn _____ calories.
Use the function to <u>solve for time</u>.

Practice

- Try to use function notation that represents each situation best.

  * For example in #1: use F(h) □ fee (output) dependent on hours (input)

For each question **1** to **3**:

a Express the relation using function notation.

b Define the domain and range. Decide what the constraints are on the domain and range based on the real-life context.

c Explain how the relation is a function.

1 A carpenter charges his clients a rate of €30 an hour, plus a single €40 fee for each job. Express the relationship between time spent on a job and the fee charged to the client.

2 A bathtub is filled with 120 liters of water. The drain plug is pulled and the water empties out at a rate of 25 liters per minute. Express the relationship between time elapsed since the plug was pulled, and the amount of water in the bathtub.

3 On a tropical island, the cost of a parcel of land is $200 per square meter. Taxes and fees account for an additional 15%. Express the relationship between the size of a parcel of land, and the final price that the client pays for it.