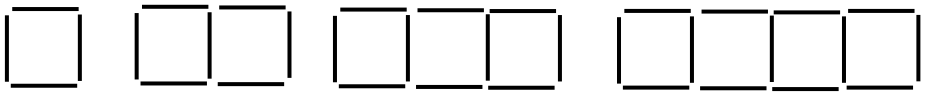
Functions Worksheet

Answer in your Maths pad

1. Consider this pattern:



Here is a table showing the number of squares and number of toothpicks:

No. squares	1	2	3	4	5	6	7	8
No. toothpicks	4	7	10	13				

By hand

a. Copy and complete the table.
b. There is a rule for finding the number of toothpicks needed if you know the number of squares. State this rule in English
c. State this rule using Algebra.
d. Explain why this rule works. Drawing a diagram may help you explain.
e. Draw the graph of the rule on the number plane.
f. How many toothpicks would you need to make:
   i. 10 squares? ii. 20 squares? iii. 1000 squares?
g. How many squares could you make if you had:
   i. 22 toothpicks? ii. 46 toothpicks? iii. 838 toothpicks?

Using your graphics calculator

h. Using your graphics calculator, plot the points on a scatterplot.
i. Enter the rule into your graphics calculator.
j. Draw the graph of the rule on your graphics calculator. Does it pass through the points?
k. Make a table with your graphics calculator.
l. Use your table to check your answers the questions to parts (f) and (g) above.

2. A computer repair person charges at the following rate: $20 plus $3 per minute
   a. Draw up a table that shows the cost for 1, 2, 3, … 10 minutes.
   b. Find the rule, and express it in Algebra.
   c. Use a graphics calculator to draw the graph.
   d. Use the graph or the table to find the cost if the time to fix the computer is:
      i. 9 minutes ii. 1½ hours.
   e. How long did a repair take if the cost of the repair was
      i. $65 ii. $116

3. To do this question, you will need some cans of different sizes, a piece of string and a ruler.

By hand

a. Copy the table below into your maths pad.

Diameter (mm)							
Circumference (mm)							

b. Measure the diameter and circumference of at least five cans, as accurately as you can. Enter the data from each measurement into your table.
c. Graph these points on a number plane. Do they form a straight line?
d. Find the rule for circumference, given the diameter.

Using a graphics calculator

e. Using your graphics calculator, plot the points on a scatterplot.
f. Enter the rule into your graphics calculator.
g. Draw the graph of the rule on your graphics calculator. Does it pass through the points?
h. Make a table with your graphics calculator.

4. You will be given a beaker by your teacher.

By hand

a. Copy the table below into your maths pad.

Height of water (mm)	10	20	30	40	50	60	70
Volume (mL)							

b. For each height, determine the corresponding volume. Enter the data into your table.
c. Graph these points on a number plane. Join them with a straight line.
d. What is the rule for finding the volume, if you know the height?

Using a graphics calculator

e. Using your graphics calculator, plot the points on a scatterplot.
f. Enter the rule into your graphics calculator.
g. Draw the graph of the rule on your graphics calculator. Does it pass through the points?
h. Make a table with your graphics calculator.

5. Using the last two examples as a guide, find the rule for finding the diameter of a square, if you know its side length. Show your work.

6. The rule for making a cup of tea is "One teaspoon of tea per person, and one for the pot."
   a. What is the Input? What is the Output?
   b. Write a rule, using algebra, which connects the two variables.
   c. Graph your rule on a graphics calculator.
   d. Make a table with your graphics calculator.