

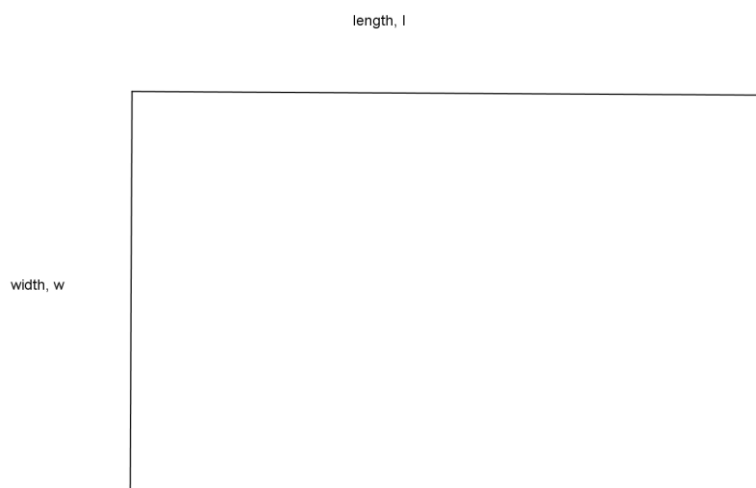
Name: \_\_\_\_\_

## CALCULUS APPLICATIONS

The task has two parts, the first part is to be completed without technology, the second part to be completed with technology.

### Part One Technology Free Time 30 minutes

Consider a rectangle with width  $w$  and length  $l$ .



Let the rectangle have a fixed perimeter of 100 cm and its area vary.

- a) Specify the area of the rectangle as a function of its width and state the domain and range of this function.

b) Sketch the graph of this function.

c) Find the maximum and minimum values for the area of the rectangle and the dimensions for which these occur.

Now let the rectangle have a fixed area of  $600 \text{ m}^2$  and its perimeter vary.

- d) Specify the perimeter of the rectangle as a function of its width and state the domain and range of this function.

- e) Draw the graph of this function.

**PTO**

- f) Find the maximum and minimum values for the perimeter of the rectangle and the dimensions for which these occur.

**END PART ONE**