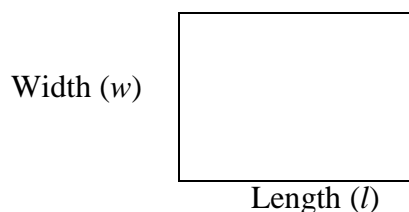


Math 3206
Maximum and Minimum Problems
Worksheet 4

1. A gardener wants to use 60 m of bordering to form a rectangular garden. Find the dimensions of the garden that will yield the maximum area. (Area = length \times width)

A) Complete the table below.



Width (x)	1	2	3	4	5
Length					
Area (y)					

B) Use a calculator to find the equation of the curve of best fit.

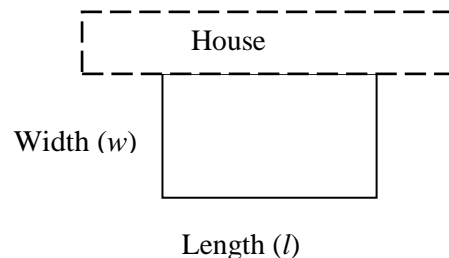
C) Find the vertex of the parabola.

D) Interpret your vertex.

The maximum area is _____ and it occurs at a width of $x =$ _____. The length of the rectangle is _____.

2. Megan wants to build a rectangular enclosure for her pet rabbit. She has 70 m of fencing and will use one side of her house for the enclosure so she will only need to fence 3 sides. Find the dimensions that will give her the maximum area. What is the maximum area?

A) Complete the table below.



Width (x)	1	2	3	4	5
Length					
Area (y)					

B) Use a calculator to find the equation of the curve of best fit.

C) Find the vertex of the parabola.

D) Interpret your vertex.

The maximum area is _____ and it occurs at a length of $x =$ _____. The width of the rectangle is _____.

3. You have 200 feet of fencing to build a rectangular enclosure. Determine the dimensions of the rectangle that will maximize the area. What is the maximum area?

Draw diagram.

Width (x)					
Length					
Area (y)					

Equation of curve of best fit _____

Vertex _____

Interpret your vertex.

What is the maximum area? _____

What are the dimensions of the rectangle? _____

4. Jason has 120 meters of fencing to make a rectangular pen for his ducks. She will use the side of a shed for one side of the pen. Find the dimensions of the rectangle that will maximize the area. What is the maximum area?

Draw diagram.

Width (x)					
Length					
Area (y)					

Equation of curve of best fit _____

Vertex _____

Interpret your vertex.

5. The base and height of a triangle have a sum of 30 cm. Find the largest area possible for such a triangle. (Area = $\frac{\text{base} \times \text{height}}{2}$)

Base (x)	1	2	3	4	5
Height					
Area (y)					

Equation of curve of best fit _____

Vertex _____

Interpret your vertex.

6. A car rental agency has 24 identical cars. The owner of the agency finds that, at a price of \$30 per day, all the cars can be rented. However, for each \$2.00 increase in rental price, one of the cars cannot be rented. What should be charged to maximize the income? What will be the maximum income? (Income = Rental Fee \times Number of Cars)

Rental Fee (x)	\$30				
# of Cars Rented	24				
Income (y)	\$720				

Equation of curve of best fit _____

Vertex _____

Interpret your vertex.

The maximum income is _____ and it occurs when the rental fee is _____.