**Maximize The Swim Space!**

# Problem:

Your summer job includes roping off an area in a lake for swimming. You only have 60m of rope and you were tasked with designing the greatest area possible for the swimmers. The area is to be rectangular and the rope must fully enclose the swimming area.

What dimensions will make the greatest swimming area?

Make several hypotheses below in the table about the dimension of the shape and calculate the area of each to discover when you reach the maximum area!

(fill in the table with your trials and extend it if required)

|  |  |  |  |
| --- | --- | --- | --- |
| Perimeter (m) | Length (m) | Width (m) | Area (m2) |
| 60 m | 29 | 1 | 29 m2 |
| 60 m |  |  |  |
| 60 m |  |  |  |
| 60 m |  |  |  |
| 60 m |  |  |  |
| 60 m |  |  |  |

What dimensions gave you the largest swimming area? What is special about these dimensions?

1. If you were given 90m of rope, what dimensions would give you the largest area?
2. Joan and Marc want to add a pool and thus need to have it fenced in. They want to minimize costs as fencing material is quite expensive, thus they want a minimal perimeter to maximize their pool area. They went out and purchased enough material to cover a perimeter of 120 meters.

a) What would the maximum area be that they can fence in?

b) If the fence pieces were each 1.5 meters long (and can’t be cut), can the same maximum area be enclosed? How do you know?

c) What if the pieces were 1.4 meters long (and can’t be cut)? What would the maximum area be in this case?

1. What if you were given the maximum area of 36 m2, what would the dimensions be?

**Work assigned:**

Workbook pages 154 # 1-5, 8, 10, 11

1. To brighten a room, a rectangular window will be built into a wall. To help keep the costs down, the perimeter must be 6.0 m. What are three possible windows you could propose? Which would you recommend and why?
2. A fence is to be built with prefabricated sections that are 2.8 m long. What is the maximum rectangular area if you have a) 20 pieces? B) 40 pieces?
3. A contractor is adding a rectangular kindergarten playground to the side of a school. The school will form one side of the rectangle and the area of the playground is to be 72 m2. What are some options you would provide the school with? What is the minimum length of fence that can be used to maximize the area to 72 m2?