4.4 Optimization Problems

To solve optimization problems,

① Draw a picture, ID what we know, ID what we need to find.

② Write formula(s).

③ Express the quantity to be maximized/minimize as a function of one variable.

④ Find the interval for the variable (if necessary)

⑤ Find the max/min (DERIVE!)

⑥ Write the answer

Example 1:
Find the two positive numbers whose sum of the first and twice the second is 100 and the product is a maximum.

Example 2:
Find the dimensions of a rectangle with a perimeter of 100m, whose area is as large as possible.

Example 3:
A manufacturer needs to design an open box with a square base and a surface area of 108 in^2. What dimensions will make a box with a maximum volume?