

Subject n°38: Functions

**Please do not write on this document, and do not forget to hand it back at the end of the test.**

A farmer needs to enclose a field with a fence. He or she has 500 feet of fencing material.

A building is on one side of the field and so no fencing is needed there.

The farmer wants to determine the dimensions of the fence that will enclose the largest area.

1. Let  $x$  be the width (in feet) of the field, show that the area (in square feet) of the field can be expressed by  $A(x) = 500x - 2x^2$
2. Find the value of  $x$  that will maximize the size of the field.
3. What is the maximum area in square feet?
4. What is the maximum area in square metres, knowing that 1 foot is 0.3048 metre?