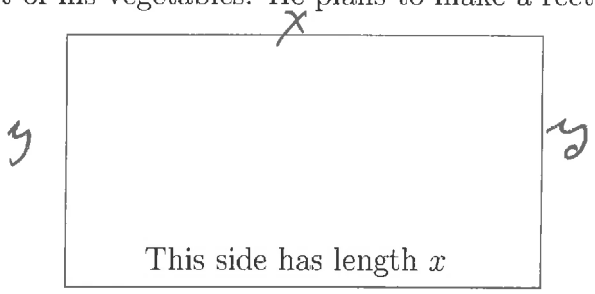
Mathematics 122

Quiz 22 Name: Key

You must show your work to get full credit.

A gardener living in the country wishes to have a garden. He has 80 feet of fencing to enclose the garden to keep the deer out of his vegetables. He plans to make a rectangular garden looking like



1. If one side has length x what is the length of the other side?

$2x+2y=80$

$2y=80-2x$

$y=\frac{80-2x}{2}$

$=40-x$

Side length is $40-y$

2. What is the area, $A(x)$, enclosed?

$A(x)=$ (length) $\times$ (width + width)

$=x(40-x)$

$A(x) = x(40-y) = 40x-x^2$

3. What choice of the side lenght x maximizes the area and what is the maximum area?

Method I calculus

$A'=40-2x=0$

$2x=40$

$x=20$ (maximum)

$A(x)=20(40-20)=400$

Maximizing x is 20 ft

Maximum area is 400 ft^2

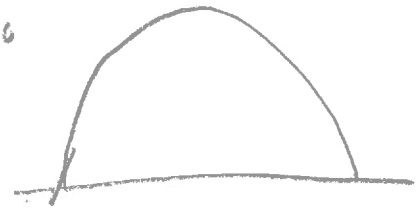
Method II calculator

$Y1=40X-X^2$

Xmin = 0

Ymax = 46

Zoom Fit



2nd calc maximum

$X=20, Y=400$