

SECTION 4.7: OPTIMIZATION PROBLEMS

DAY I

STEPS IN SOLVING OPTIMIZATION PROBLEMS

1)



2)



3)



4)



5)



6)



EXAMPLE 1

A farmer has _____ of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fence along the river. What are the dimensions of the field that has the largest area?

EXAMPLE 2

A cylindrical can is to be made to hold _____ of oil. Find the dimensions that will minimize the cost of the metal to manufacture the can.

THE FIRST DERIVATIVE TEST FOR ABSOLUTE EXTREME VALUES

Suppose that c is a critical number of a continuous function f defined on an interval.

- ★ (a) If $f'(x) > 0$ for all $x < c$ and $f'(x) < 0$ for all $x > c$, then $f(c)$ is the _____
_____.
- ★ (b) If $f'(x) < 0$ for all $x < c$ and $f'(x) > 0$ for all $x > c$, then $f(c)$ is the _____
_____.

EXAMPLE 3

Find the point on the parabola $y^2 = 2x$ that is the closest to the point _____.