

Optimization Problem: Applied Max./Min.

Another application of the derivative

November 16, 2009

General Framework:

- 1 Read and understand the problem. Make sure you know what information is given to you, and what you are being asked.
- 2 Draw a diagram, introduce notation & label.
- 3 Determine what quantity is to be maximized/minimized and express it in terms of other variables.
- 4 If the function has more than one variable, use constraints to eliminate variables.
- 5 Find the absolute max. or min. on the functions domain.
Justify why it answers the question!

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A farmer has 2400 ft. of fencing for a rectangular field that borders a river. He needs no fence along the river. Find the dimensions of the field that has largest area.

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A rectangular storage container with an open top is to have volume 10 ft^3 . The length of its base is to be twice its width. The material for the base costs $\$10/\text{ft}^2$ and material for the side costs $\$6/\text{ft}^2$. Find the dimensions of the cheapest such container.

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An clown ambulance is rushing to the site of a poodle collision that occurred in a field 5 km from the highway. The ambulance can travel 130 km/hr on the highway and only 50 km/hr on the field. Given that the closest point to the crash site from the highway is 8 km away, what is the least amount of time it will take for the clowns to reach the crash site?

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