

LESSON 5: SOLVING MAX/MIN PROBLEMS

Objective:	1. To use the derivative to locate absolute extrema in problem solving
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Solving Optimization Problems

1. Read carefully
2. State known values, unknowns, feasible domain
3. Set up problem with sketch, primary equation, and secondary equation
4. Write as a function in one variable
5. Find the derivative
6. Solve
7. Examine results for correctness and reasonableness

Examples

1. Construct a box (Class Activity)
2. A rancher wishes to fence off a rectangular pasture along a straight river, the side along the river requiring no fence. She has enough barbed wire to build a fence 6000 feet long. What are the dimensions of the pasture which gives the largest grazing area?
3. Finding a Minimum Distance: Which points on the graph of $y = 4 - x^2$ are closest to the point (0,2)?

4. Points A and B are opposite each other on shores of a straight river 200 yards wide. Point C is on the same shore as B but 150 yards down the river from B. A utility company plans to lay a cable from A to C. If the cost of laying cable underwater is \$95 per yard and the cost of laying cable on land is \$55 per yard, then how should the cable be laid in order to minimize the cost of the project?

5. Cola Can (Class Activity)

