

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [6 points] A rectangular box with a square base is to have volume 256 in^3 . Find the dimensions of the box that minimize the amount of materials needed to construct it (i.e., its surface area).

Make a sketch on the right of the page and assign variables.

Objective Function:

Auxiliary Equation:

Optimization Step:

2. [6 points] Find an equation for the tangent line to the graph of

$$2x^2 - xy^2 + y = -7$$

at the point $(x, y) = (2, 3)$. (Use implicit differentiation to find the slope.)