Group Exam 3

Name: _____

Math 141

Name of group member: _____

Name of group member: _____

Problem 1: A rectangular storage container with an open top is to have a volume of 10 m^3. The length of its base is twice the width. Material for the base costs \$10 per square meter. Material for the sides costs \$6 per square meter. Find the cost of materials for the cheapest such container and the dimensions that attain the minimum cost.

Cost of cheapest container: _____ Dimensions: _____

Signature line: _____ _____

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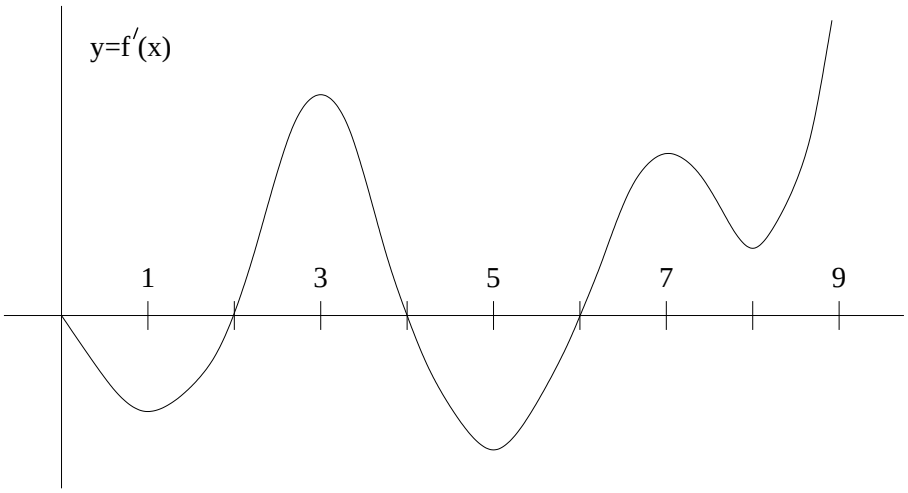
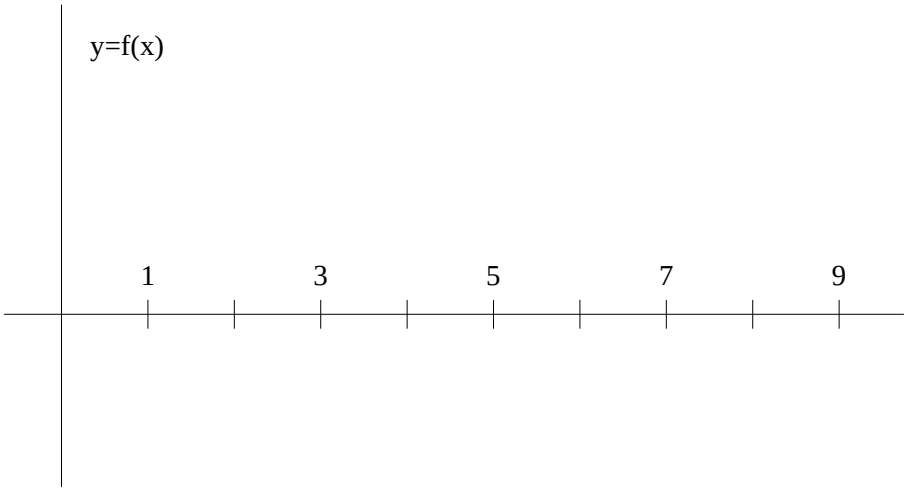
Problem 2: Part A. Fill in the blanks.

If c is a critical number of $f(x)$ and $f''(c) = 3$, then $(c, f(c))$ is a local _____ of $f(x)$.

If c is a critical number of $f(x)$ and $f''(c) = -3$, then $(c, f(c))$ is a local _____ of $f(x)$.

Part B. The graph of the **derivative** of f is given below. Use this graph to sketch the graph of $f(x)$ in the space provided below. Include the x-values of all **local maximums** and **minimums** and all **inflection points** in your sketch of $f(x)$.





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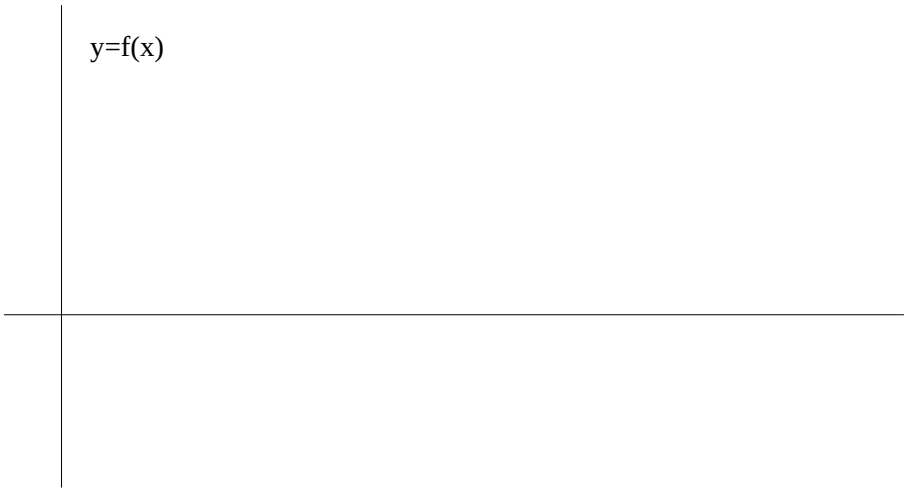
Problem 3: Part A. Use calculus to sketch the graph of the function whose equation is provided below. Include all **local maximums** and **minimums** and all **inflection points** in your sketch of $f(x)$.

$$f(x) = \tfrac{1}{2}x + \cos(x) \qquad \text{on the interval } [0, 2\pi]$$



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