1. Consider the loosely defined problem of "optimizing windshield-wiper placement on an automobile." Formulate this as an optimization problem, listing given, variables, objective function and constraints. There are many possible answers. Your formulation need not be mathematically rigorous. For example, a valid objective function statement can be "the area swept by the windshield wipers" without giving an equation for this. What type of an optimization problem is your formulated problem, in terms of the categories listed in class?

2. Prove (using rigorous mathematical language) that minimizing $f(x)$ subject to $x \in F$ is equivalent to maximizing $-f(x)$ subject to the same constraint.

3. Prove (using rigorous mathematical language) that minimizing $f(x)$ subject to $x \in F$ is equivalent to minimizing $g(f(x))$ subject to the same constraint for any monotonic increasing function $g$.

4. Puzzler (for fun!). Attached.