Answer each of the following. If you wish to receive partial credit, please show all work
(NO WORK = NO CREDIT.) In particular, credit will not be given for a “correct answer”
when the accompanying work is nonexistent.

1. Find all relative extreme values of the function below. (Hint: Use the D-Test).

   \[ f(x, y) = y^3 - x^2 - 2x - 12y \]

2. Use Lagrange Multipliers to solve the following problem.

   A farmer wants to make two identical rectangular enclosures alongside his barn. (One for his pigs,
   and one for his goats.) If he has 600 feet of fence, and if the sides of the enclosures along the barn don’t
   need a fence, what are the dimensions **of each enclosure** that maximize the area?