

NAME: _____

Do not write your answers here. Use the graph paper attached to do the graph.

Write your answers in other sheets and **STAPLE** them to this one.

1. What is the minimum vertical distance between the parabola $y = x^2$ and the line $y = 2x - 6$?
2. A rectangular storage container without a lid 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 least expensive such container.
3. Find the dimensions of a rectangle with perimeter 100 m whose area is as large as possible.
4. **Extra credit.** Find the area of the largest rectangle that can be inscribed in the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$, as in the picture.

