

Calculus Worksheet #4 Unit 8 _____

Solve each of the following problems. Show your work and your solutions neatly organized on separate work paper.

1. Find the least and the greatest straight line distance between the ellipse $x^2 + 9y^2 = 9$ and the point $(0, 2)$.
2. A messenger is to go ashore from a ship that is 8 miles offshore and deliver a message to a camp that is 20 miles up the beach from the point nearest the ship. He can go 15 mph by boat and will be met by a jeep that can go 25 mph over the beach. Where should he land to complete the trip in as short a time as possible?
3. A log is 20 feet long and tapers from a diameter of 4 feet at one end to a diameter of 3 feet at the other. Find the diameter of the cylinder with the largest volume that can be cut from the log.
4. Two vertices of a rectangle are on the x-axis, and the other two are on the curve $y = 8/(x^2 + 4)$. Find the maximum area of the rectangle.