MATHEMATICS 3100-1. Homework # 10.

April 2

1. Problems 4, 7, section P-8.

2. Consider a cone of height h over the circle $C(O,R)$ of radius R and center O, so that the vertex V of the cone is above the center O. Let X and Y be points on the circle $C(O,R)$ so that the angle XOY is straight (i.e. the distance between X and Y is $2R$). See Figure 1. Imagine that an ant is going from the point X to the point Y along the surface of the cone. Compute (in terms of R and h) the length of the shortest path that the ant can take.

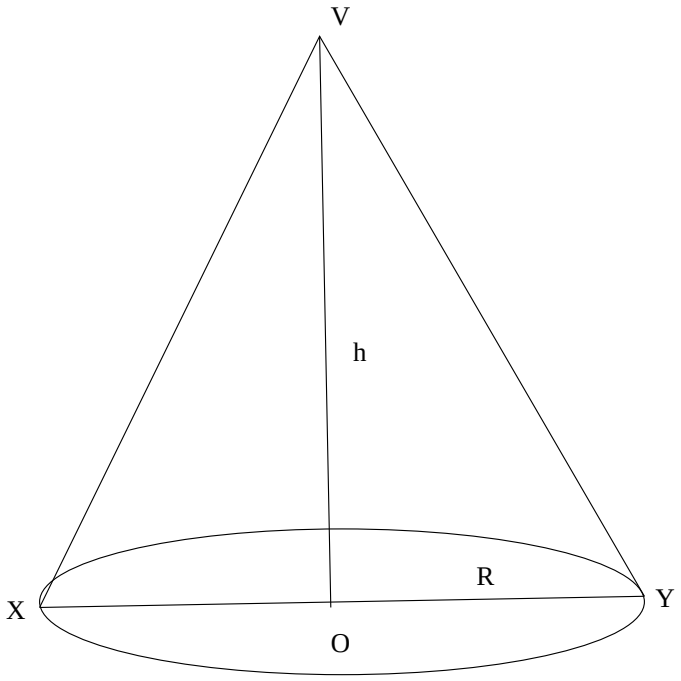

Figure 1: *The cone.*

Hint: Cut the surface of the cone along the segment VX and put the resulting surface on the plane (see Figure 2 on the next page). Which path the ant should take on the flatened cone?

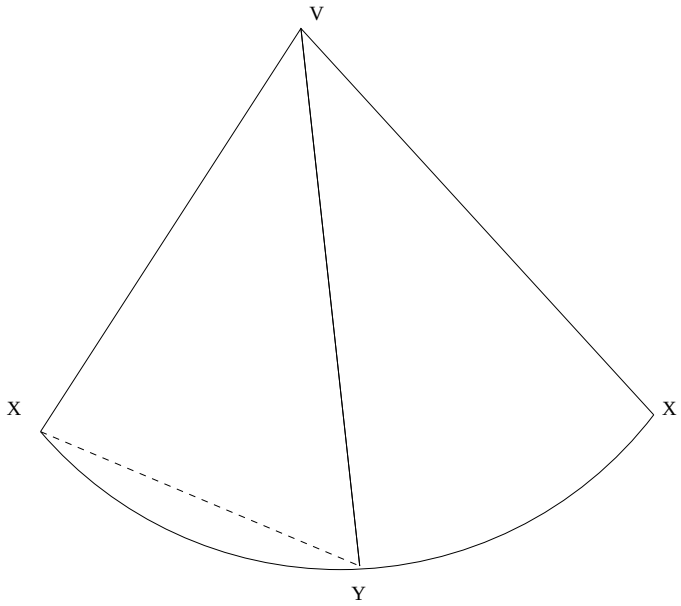

Figure 2: *The flatened cone.*