EE 271 - ABET_Quiz

Oct. 30, 2019

Name _____

The Volume V and the area A of a conical paper cup are given by

$$V = \frac{1}{3}\pi r^2 h \qquad A = \pi r \sqrt{r^2 + h^2}$$

where r is the radius of the base of the cone and h is the height of the cone.

1. Create a user-defined function that accepts r as the only argument and computes A for a given value of V. Declare V to be global within the function.

2. For $V = 10\ in^3$, use the user-defined function and a minimizaton function from MATLAB to compute the value of r that minimizes the area A.

3. What is the corresponding value of the height h?

4. Investigate the sensitivity of the solution by plotting V versus r. How much can r vary about its optimal value before the area increases 10 percent above the minimum value?