

Name: _____

Surface Color: _____

Task Master: _____

Cynic: _____

Recorder: _____

The Cake

*Working in small groups (3 or 4 people), solve as many of the problems below as possible. Try to resolve questions within the group before asking for help. Each group member should then write up solutions in their own words; please do not use this sheet for that purpose, but **please turn in this sheet as well**. Show your work! Explain why your answers work.*

On your Mark: You are taste-testing various cakes, samples of which are plotted on the handout. Choose a *cake* from the handout. The contours represent the height (in inches) of a 2 inch by 4 inch cake which has been divided into four pieces. Rank the four pieces according to the total amount of cake.

Amount of Cake: Least _____ _____ _____ _____ Greatest

Get Set: Estimate the volume of your largest piece of cake. Include units.

(1) Under-estimate:

(2) Over-estimate:

Go: Describe two ways to reduce the error between your estimates.

Challenge: The cake's caloric density is given by $\rho(x, y, z) = \frac{10}{\sqrt{z}} \frac{\text{cal}}{\text{in}^3}$ (Heavy ingredients like chocolate chips and nuts can settle during baking.) How many calories are in your largest piece of cake?

