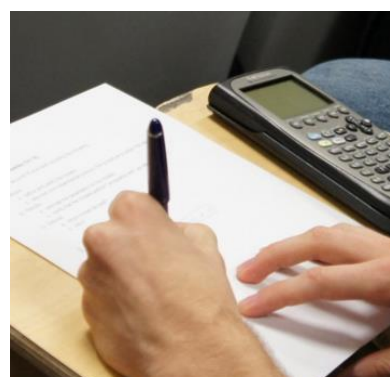


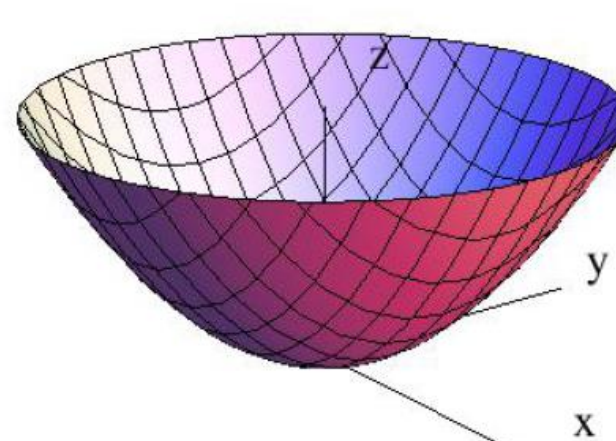
Coffee Thermocline Lab

Laboratory Experiences in Mathematical Biology

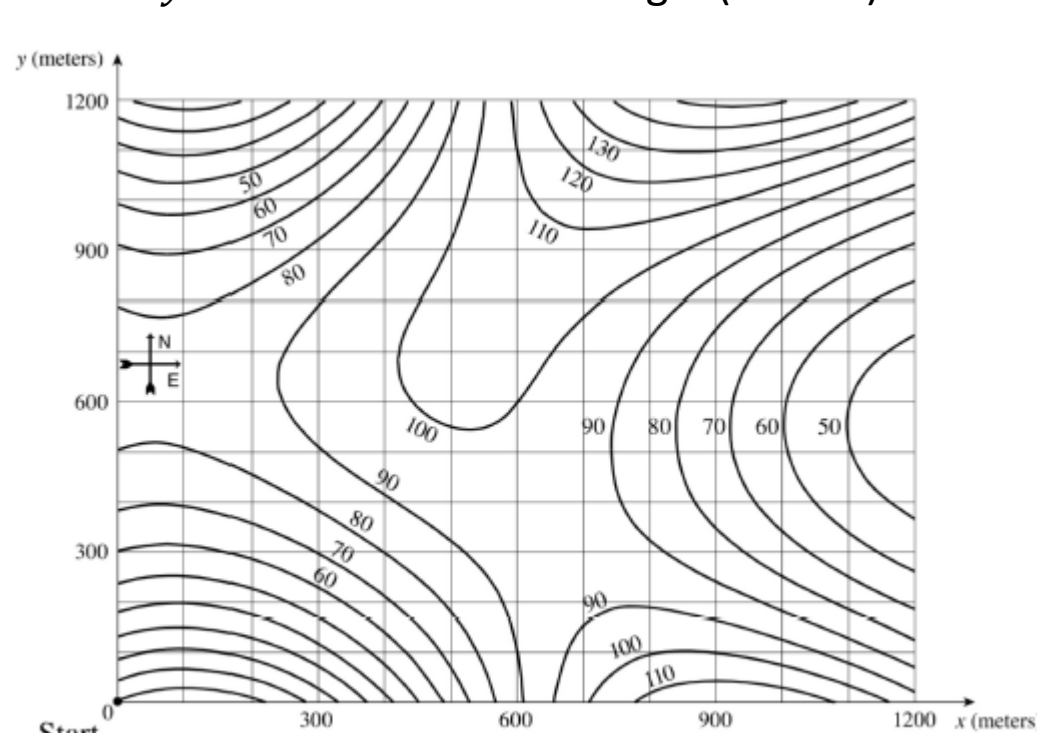


Assessment Items: Primary assessment of student learning is taken from students' written reports additional assessment items targeting lab objectives are included here.

1. Give two examples of functions of more than one variable arising in real-world contexts. What are the independent and dependent variables of each function?
2. Consider the following graph. Sketch the trace in the y, z -plane.



3. Explain how the level curves indicate the steepness of a graph of a function of two variables.
4. How useful (if at all) do you think will mathematical models be in your future career?
Circle one:
not at all useful = 0 1 2 3 4 = extremely useful
Explain your response.
5. Provide two examples of multivariable functions arising in real-life contexts. What are the dependent and independent variables in each case?
6. The figure below is a map showing curves of the same elevation of a region in Orangerock National Park. We define the altitude function $A(x, y)$ as the altitude at a point x meters east and y meters north of the origin ("Start").



- a) Estimate $A_x(300, 300)$ and $A_y(300, 300)$.
 - b) What do A_x and A_y represent in physical terms?
7. How useful (if at all) do you think reasoning with limits and partial derivatives will be in your future career?
Circle one:
not at all useful = 0 1 2 3 4 = extremely useful
Explain your response.