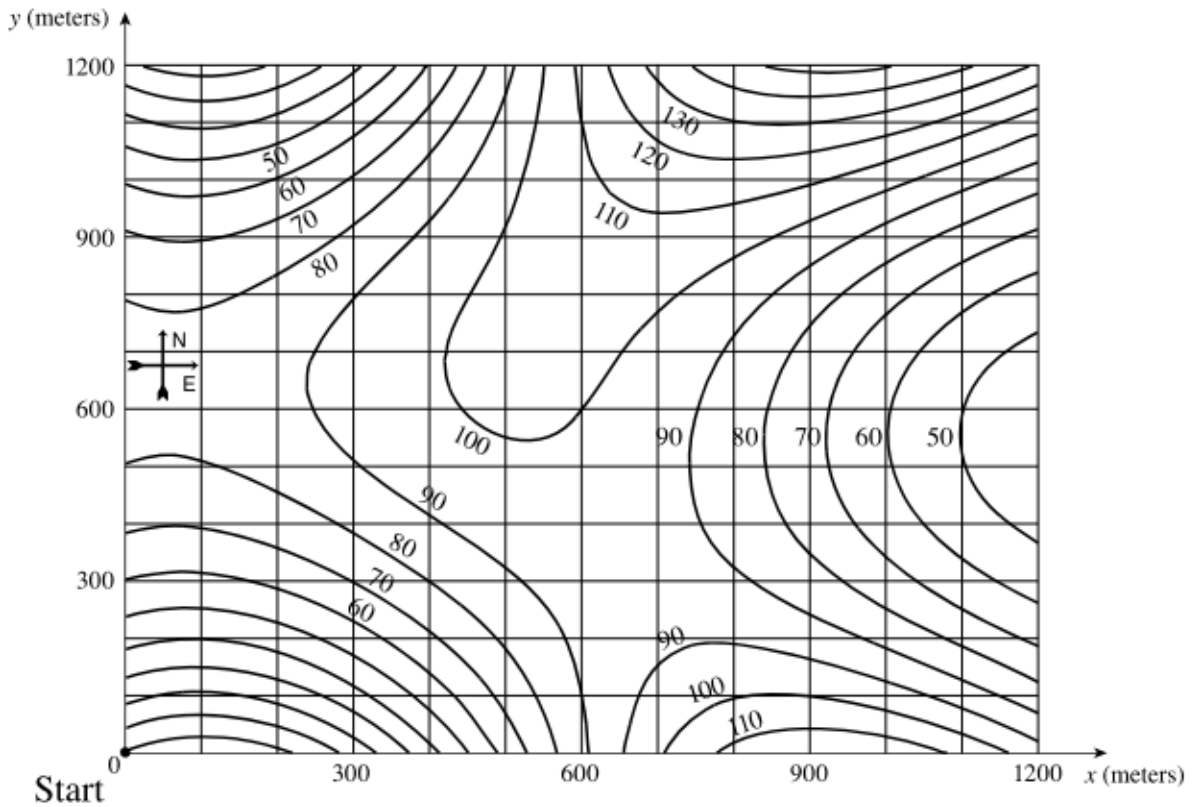


The following is a map with curves of the same elevation of a region in Orangerock National Park:



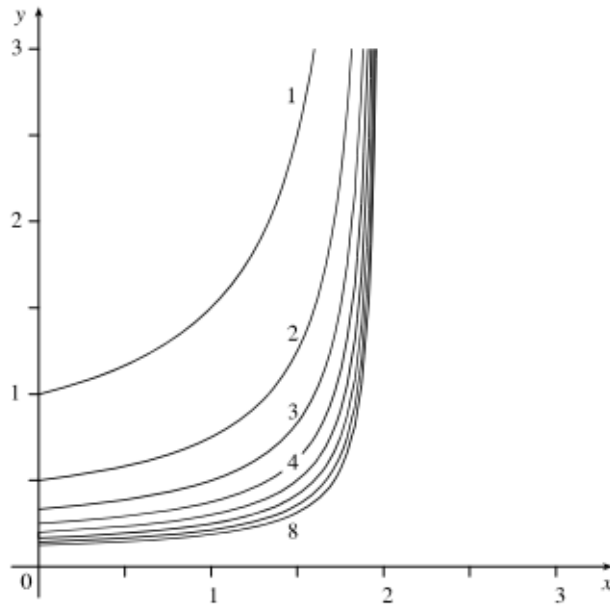
We define the altitude function, $A(x, y)$, as the altitude at a point x meters east and y meters north of the origin ("Start").

1. Estimate $A(300, 300)$ and $A(500, 500)$.
2. Estimate $A_x(300, 300)$ and $A_y(300, 300)$.

3. What do A_x and A_y represent in physical terms?
4. In which direction does the altitude increase most rapidly at the point $(300, 300)$?
5. Use your estimates of $A_x(300, 300)$ and $A_y(300, 300)$ to approximate the altitude at $(320, 310)$.

Some 329 practice – Fall, 2015

The level curves of a function $z = f(x, y)$ are given below.



Use the level curves of the function to decide the signs (positive, negative, or zero) of the derivatives f_x , f_y , f_{xx} , f_{yy} , f_{xy} , and f_{yx} of the function at the point $(\frac{3}{2}, \frac{1}{2})$.