Michael Kwan
Intro to Machine Learning
Homework 0

1. $f(10-0.01) < f(10)$

If you know the slope of the best straight line approximation, you can easily determine if $f(10-0.01)$ or $f(10+0.01)$ is less than $f(10)$ by looking at if the slope is positive or negative. In this case, the slope is positive, so any value of x greater than 10 would yield a value greater than $f(10)$ and any value of x less than 10 would yield a value less than $f(10)$.

2. You cannot know because of the variables c_1, c_2, and c_3. Since the slope of the best straight line approximation is greater than 0 at $x=10$, the slope is positive. So, $f(10+0.01) > f(10)$.

3. You can keep looking for a path that descends and keep following it until you get to the valley.

4. If there is more than one valley, you might accidentally go to the wrong valley if you followed the above algorithm.

5. $p_h = \frac{3}{5}$ $p_H = \frac{3}{5}$ would maximize $(p_H)^{30}(1-p_H)^{20}$

The maximum would still be the same because you are doing the same function to the entire binomial distribution.