Homework #4 Extra Credit

Due: June 7, 2017   **Points:** 30

1. (*30 points*) In Section 18.3.2.3, the formula

$$I(A\,;X) = -p(1-q)^n \lg p + p[1-(1-q)^n]\lg[1-(1-q)^n] - [1-p(1-q)^n]\lg[1-p(1-q)^n]$$

   is derived. Prove that $I(A\,;X)$ is a maximum with respect to p when $p = \frac{M}{Mm+1}$, with M and m as defined in that section.