

8. [16 points] Some airlines have started offering wireless internet access during flight. The company *WiFi Up High* (WFUH) would like to enter the market and begin working with airlines to offer such service. WFUH will charge passengers based on the amount of time the passenger uses the service during flight.

Preliminary research indicates that during NW flight 2337 (which flies from Detroit to Los Angeles), the number of hours of wifi that will be used by passengers at a price of  $p$  dollars per hour is given by the function

$$h(p) = \frac{45000}{149 + e^{0.4p}}.$$

Since offering wifi to its customers is likely to increase business for the airline, WFUH also plans to charge the airline a flat fee of  $a$  dollars per flight on which the service is offered.

- a. [3 points] If WFUH offers its service to passengers at a price of \$2 per hour, what will be its expected revenue from one NW 2337 flight?
- b. [8 points] Use calculus to determine how much WFUH should charge passengers per hour of usage in order to maximize its revenue from NW flight 2337. (Round your answer to the nearest \$0.01.)
- c. [5 points] Suppose that WFUH initially decides to charge \$12.50 per hour of use. Note that  $h(12.50)$  is approximately 151. Suppose the marginal cost to WFUH when 151 hours of wifi are being used is \$5 per hour of use. In order to increase its profit, should WFUH raise or lower the price it is charging per hour of use on NW flight 2337? Explain.

