Practice – 2

Once you feel confident with Maximum and Minimum Problems: Extreme Values in Economics, complete problems 1 to 3. Check your answers by going to the Solutions tab in Moodle.

Instructions: Answer each of the following practice questions on a separate piece of paper. Step by step solutions are provided under the Solutions tab. You will learn the material more thoroughly if you complete the questions before checking the answers.

1. The cruising speed of an airplane is 300 km/h. The formula $C = 250 + \dfrac{h}{10} + \dfrac{2\ 500\ 000}{h}$

   represents the cost per hour of flying the airplane, where h is the height in metres.

   Determine the height at which the cost of flying is a minimum.

2. A motel has 40 rooms. Each rooms costs $\$60$ per night. For each $\$5$ per night increase, there is one additional room left vacant.

   a. What should be the price per room to maximize the motel's total revenue?

   b. What is the maximum possible nightly revenue?

3. During the summer, Dana offers a lawn-mowing service. Last summer, Dana charged $\$15$ per job and averaged 15 customers per week. If she increased her price by $\$2$, she lost one customer per week. If her overhead per job is $\$5$,

   a. what should she charge in order to maximize her profits,

   b. how many customers will she have, and

   c. what is the maximum possible profit?