In-Class Assignment 8: Optimization

MATH 141

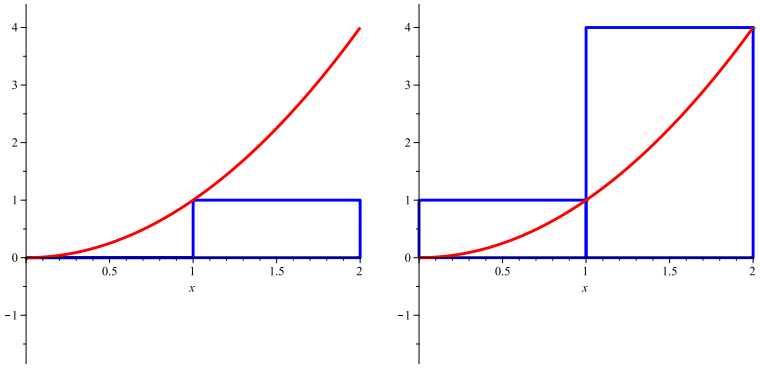
Directions: Work neatly on a separate sheet of paper. Your group will hand in one write-up with everyone's name on it. **DO NOT** fold the corner over to hold everything together! Your final write-up should be very neat and well-written. Remember to use complete sentences as appropriate.

Work together on each problem; do not delegate different problems to different people.

REMEMBER TO SHOW YOUR WORK!

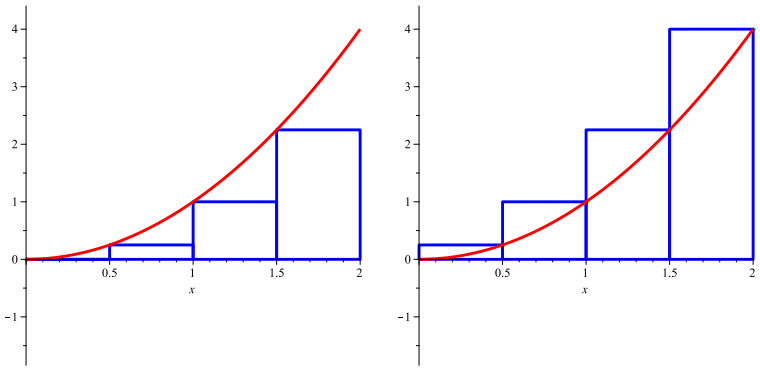
1. In this problem, you will estimate the area under the graph of $f(x) = x^2$ between $x = 0$ and $x = 2$. The graphs below show approximations of the area from above and below.

   (a) Find the area of each rectangle and the upper and lower approximations. Average them for a better approximation.



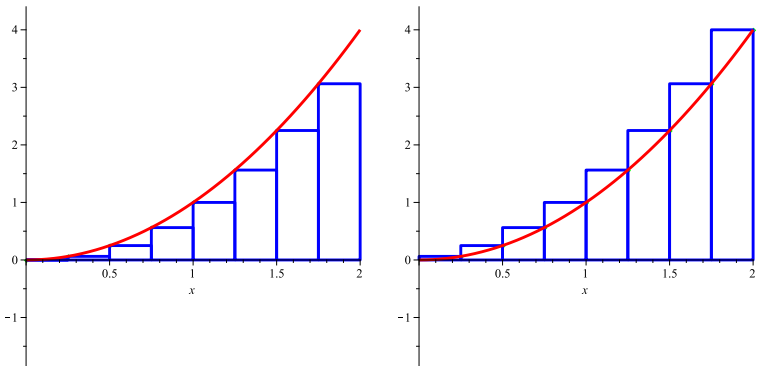
   Approximation: _____

   (b) Find the area of each rectangle and the upper and lower approximations. Average them for a better approximation.



   Approximation: _____

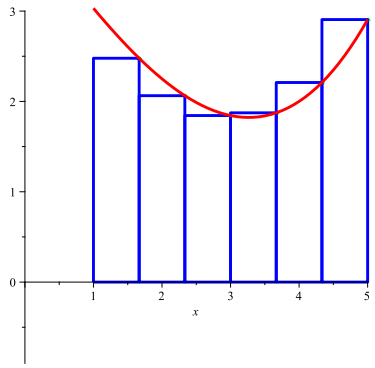
   (c) Find the area of each rectangle and the upper and lower approximations. Average them for a better approximation.



   Approximation: _____

(OVER)

2. Consider the graph of $y = f(x)$ drawn below.



(a) Assuming that the rectangles shown are equally spaced, what are their right endpoints?

(b) What is the height of each rectangle? Express your answer in terms of f.

(c) What is the approximation to the area under the graph of f given by the rectangles?