Worksheet on Riemann Sums

Math 31L, Blake

Consider the Riemann Sum $\sum_{k=0}^{499} \left[5 - (2 + 0.006k)^2\right] \Delta x$

1. What is the value of Δx?

2. What definite integral is being approximated?

3. Is this Riemann sum an overestimate or an underestimate of the integral you gave in part 2, or is it impossible to tell? Explain your answer.

4. Suppose we write another Riemann sum to approximate the same definite integral. This new Riemann sum has the following form:

$$\sum_{k=0}^{9999} \left[5 - (2 + \underline{\qquad\qquad\qquad\qquad}\,)^2\right] \Delta x$$

(a) What is the new value of Δx? _____

(b) Fill in the blank in the new Riemann sum.

(c) Is this new Riemann sum an overestimate or underestimate of the definite integral? Explain your answer.

(d) Is this new Riemann sum smaller or larger than the first one? Explain your answer.