Instructions  Please write your name in the upper right-hand corner of the page. Write complete sentences to explain your solutions.

1. Suppose $f(x) = 4 \cos x$. Show that the Riemann sum for the function $f$ on the interval $[0, \pi/2]$ using left-hand endpoints for the partition $\{0, \pi/6, \pi/4, \pi/3, \pi/2\}$ is equal to $\pi (6 + \sqrt{3} + \sqrt{2})/6$.
   [This is exercise 8 on page 377 of the textbook.]

2. Express $\lim_{n \to \infty} \sum_{i=1}^{n} \frac{2}{n} \sin \left( \frac{4i^2}{n^2} \right)$ as a definite integral.
3. Let $p_1 = 2$, $p_2 = 3$, $p_3 = 5$, and in general let $p_n$ be the $n$th prime number. What is the smallest value of $k$ for which $\sum_{i=1}^{k} \frac{1}{p_i} > 1$?

4. The figure shows the graph of a function $f$. Estimate the value of $\int_{0}^{4} f(x) \, dx$ by using a regular partition with four subintervals and choosing right-hand endpoints.