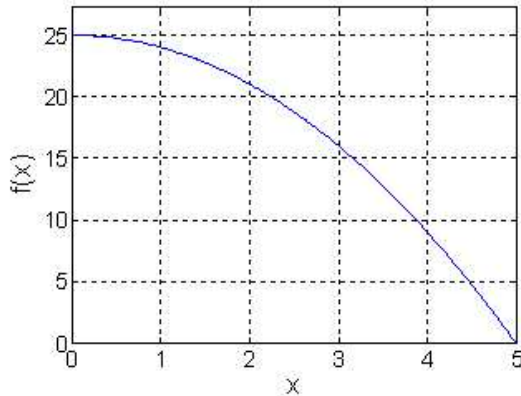


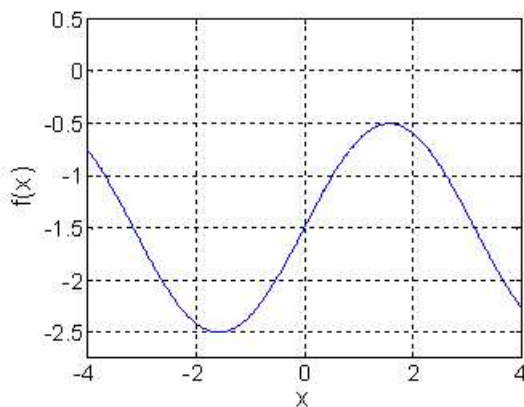
Classroom Voting Questions: Calculus II

Section 5.2 The Definite Integral

1. Which of the following is the best estimate of $\int_0^3 f(x)dx$, where $f(x)$ is given in the figure below?



- (a) 13
(b) 17
(c) 65
(d) 85
2. Which of the following is the best estimate of $\int_{-2}^2 f(x)dx$, where $f(x)$ is given in the figure below?



- (a) -4
(b) -6

- (c) 3
 - (d) 6
 - (e) 12
3. Make a sketch of the function $f(x) = \cos x$ and decide whether $\int_{-1.5}^0 f(x)dx$ is:
- (a) Positive
 - (b) Negative
 - (c) Zero
4. Make a sketch of the function $f(x) = -x^3$ and decide whether $\int_{-5}^5 f(x)dx$ is:
- (a) Positive
 - (b) Negative
 - (c) Zero
5. **True or False:** If a piece of string has been chopped into n small pieces and the i^{th} piece is Δx_i inches long, then the total length of the string is exactly $\sum_{i=1}^n \Delta x_i$.
6. You want to estimate the area underneath the graph of a positive function by using four rectangles of equal width. The rectangles that must give the best estimate of this area are those with height obtained from the:
- (a) Left endpoints
 - (b) Midpoints
 - (c) Right endpoints
 - (d) Not enough information
7. Suppose you are slicing an 11-inch long carrot REALLY thin from the greens end to the tip of the root. If each slice has a circular cross section $f(x) = \pi[r(x)]^2$ for each x between 0 and 11, and we make our cuts at $x_1, x_2, x_3, \dots, x_n$ then a good approximation for the volume of the carrot is
- (a) $\sum_{i=1}^n f(x_i)x_i$
 - (b) $\sum_{i=1}^n [f(x_{i+1}) - f(x_i)]x_i$
 - (c) $\sum_{i=1}^n f(x_i)[x_{i+1} - x_i]$
 - (d) None of the above.

8. Let f be a continuous function on the interval $[a, b]$.

True or False: $\lim_{n \rightarrow \infty} \sum_{i=1}^n f(x_i^*) \Delta x_i$ may lead to different limits if we choose the x_i^* to be the left-endpoints instead of midpoints.