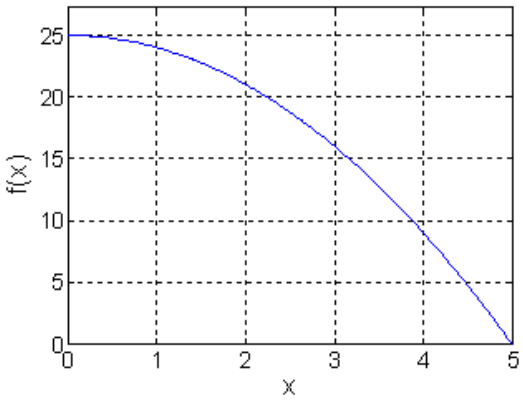
Classroom Voting Questions: Calculus II

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?



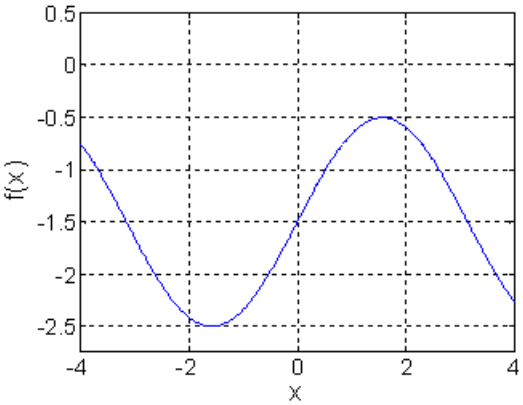
(a) 13

(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 $\sum_{i=1}^{n} \Delta x_i$.

   (a) True, and I am very confident

   (b) True, but I am not very confident

   (c) False, but I am not very confident

   (d) False, and I am very confident

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 $x_1, x_2, x_3, \ldots, x_n$ 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: $\lim_{n\to\infty} \sum_{i=1}^{n} f(x_i^*)\Delta x_i$ may lead to different limits if we choose the x_i^* to be the left-endpoints instead of midpoints.

(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

(d) False, and I am very confident