Names_____

Calculus Test #11
Take Home Portion

Show all work that leads to your answer (when applicable).

1. Consider $F(x) = \int_1^x (t^3 + \sqrt{t})dt$. Find $F'(x)$.

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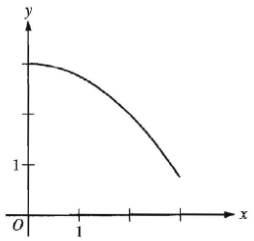
2. Suppose we know that $\int_1^{10} (3k(x) + 5)\, dx = 66$. What is the value of $\int_1^{10} k(x)dx$?

3.



Graph of f

The graph of the function f is shown above for $0 \le x \le 3$.

I. Of the following, which has the **least** value? _____

II. Of the following, which has the **most accurate** value? _____

A. $\int_1^3 f(x)dx$

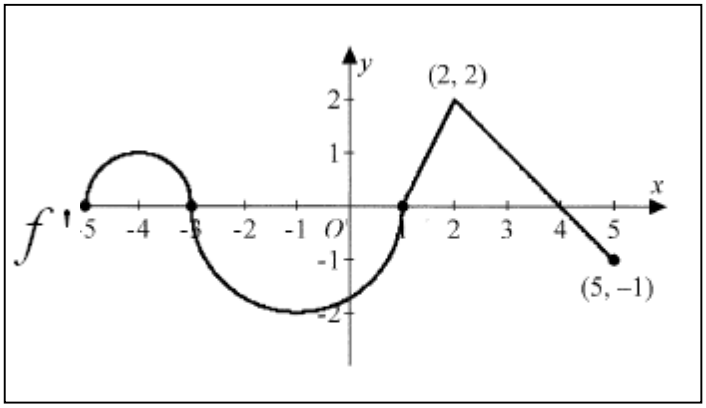
B. Left Riemann sum approximation of $\int_1^3 f(x)dx$ with 4 subintervals of equal length

C. Right Riemann sum approximation of $\int_1^3 f(x)dx$ with 4 subintervals of equal length

D. Midpoint Riemann sum approximation of $\int_1^3 f(x)dx$ with 4 subintervals of equal length

E. Trapezoidal sum approximation of $\int_1^3 f(x)dx$ with 4 subintervals of equal length

4. Let f be a function defined on the closed interval $-5 \le x \le 5$ with $f(1) = 3$. The graph of f', the derivative of f, consists of two semicircles and two line segments as shown to the right.



a) For $-5 < x < 5$, find all values of x at which f has a relative maximum. Justify your answer.

b) b) For $-5 < x < 5$, find all values of x at which f has a point of inflection. Justify your answer.

c) Find all intervals on which the graph of f is concave up and also has a positive slope.

d) Find the absolute minimum value of $f(x)$ over the closed interval $-5 \le x \le 5$. Explain your reasoning.

Don't forget to log in to www.coursesites.com to take the other portion of this test.