Math 13  Fall 1999
EXAM 4 (sample)

1. Suppose (i) \( \int_{0}^{2} f(x)dx = 2 \), (ii) \( \int_{1}^{2} f(x)dx = -1 \), (iii) \( \int_{2}^{4} f(x)dx = 5 \). Evaluate
   \( \int_{1}^{4} f(x)dx = 2 \), (b) \( \int_{0}^{1} f(x)dx \), (c) \( \int_{2}^{2} f(x)dx \).

2. Suppose that \( F \) is an antiderivative of a differentiable function \( f \). (a) If \( F \) is increasing on \( [a, b] \), what is true about \( f \)? (b) If \( f' \) is negative, what is true about \( F' \)?

3. Suppose that \( F(x) = \int_{1}^{x} f(u)du \). Evaluate the following in terms of \( F \):
   \( \int_{1}^{3} f(x)dx \), (b) \( \int_{-1}^{2} f(x)dx \).

4. Evaluate the following: (a) \( \int_{1}^{2} \sqrt{x+1}dx \), (b) \( \int_{0}^{\pi/2} \cos(2x)dx \).

5. Let \( f \) be the function graphed below. Estimate the value of \( \int_{0}^{8} f(x)dx \) by finding the right and midpoint sums each with 4 equal subintervals.

   ![Graph of a function](image)

6. Sketch the region between the curves \( y = -x^2 \), \( y = -x - 1 \) and find the area of the region.