Warm-Up Problems
January 24, 2003

1. Compute the following integrals, interpret the result geometrically for the definite integrals.

   (a)
   $$\int 3\sin(x)\,dx$$

   (b)
   $$\int_0^1 x^{7/3}\,dx$$

   (c)
   $$\int \sec^2 x + 1\,dx$$

   (d)
   $$\int_0^1 \frac{1}{t^2+1}\,dt$$

2. Suppose you know the following definite integrals:
   $$\int_1^3 f(x)\,dx = 4 \qquad \int_2^5 f(x)\,dx = -7 \qquad \int_3^5 f(x)\,dx = 1 \qquad \int_1^5 g(x)\,dx = -2$$
   Find the following integrals:

   (a)
   $$\int_1^5 f(x)\,dx$$

   (b)
   $$\int_2^3 f(x)\,dx$$

   (c)
   $$\int_1^5 f(x) + g(x)\,dx$$

   (d)
   $$\int_1^5 4f(x) - 3g(x)\,dx$$

3. Find a so that
   $$\int_1^a x^2\,dx = 5$$