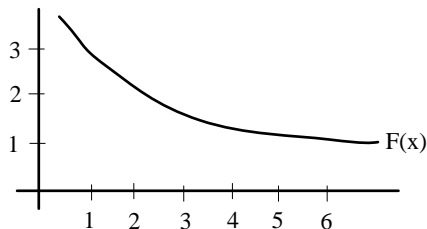


MCS-121**Definite Integrals and the FTC**

1. Let $F(x)$ be the function whose graph is given and let $F'(x) = f(x)$. Use the Fundamental Theorem of Calculus to find $\int_2^5 f(x) dx$.



2. In this problem you are to calculate the value of the following integral both numerically and algebraically. $\int_0^4 \frac{x}{\sqrt{x^2+1}} dx$.

- (a) If you estimate the value of the integral using 20 subdivisions, the width of the each subdivision will be _____ and the left hand sum will be _____.
- (b) Verify that the derivative of $\sqrt{x^2+1}$ is $\frac{x}{\sqrt{x^2+1}}$.

- (c) Use the Fundamental Theorem of Calculus to find an exact value for the integral.

3. Suppose $F'(x) = e^{-x^2}$ and $F(0) = 2$. Estimate $F(1)$ and $F(2)$.