

Math 125 Worksheet #2

July 3, 2007

1. Find the most general form of a function f such that $f''(x) = 2e^x - 12x$.
2. Find the area under the curve $f(x) = \frac{8}{x^3} + 4x$ between $x = 1$ and $x = 3$.
3. Consider $\int_{-1}^2 \frac{1}{x} dx$. Can you evaluate this integral using the FTC? If so, what do you get? If not why? (See the graph of $f(x) = \frac{1}{x}$.) Does the definite integral $\int_{-1}^2 \frac{1}{x} dx$ have a finite value?
4. Find $\int_{-1}^3 h(t) dt$ for $h(t) = \begin{cases} t + 2 & \text{if } t \leq 1 \\ 3t^2 & \text{if } t > 1 \end{cases}$.
5. Let $g(x) = \int_0^x e^t - 5\sin t dt$ for $0 \leq x \leq \pi$.
 - (a) Find $g(\pi)$.
 - (b) Find $g'(x)$.