

Math 1A Worksheet 31

May 5th, 2008

1. (Repeat) Find $\int x^5 \sqrt[3]{x^3 + 1} dx$.
2. Find $\int_{-2}^2 (x + 3) \sqrt{4 - x^2} dx$.
3. Find $\int_{-2}^2 \sqrt{4 - x^2} dx$.
4. a) Find a number a such that the line $x = a$ bisects the area under the curve $y = 1/x^2$, $1 \leq x \leq 4$.
b) Find a number b such that the line $y = b$ also bisects the same area.
5. Consider the region bounded by the curves $x + y^2 = 2$ and $x + y = 0$.
 - a) Sketch this region, making sure to label the points of intersection.
 - b) Think of y as a function of x , and sketch four (tall and narrow) approximating rectangles.
 - c) Still thinking of y as a function of x , express the area of this region as a sum of two definite integrals.
 - d) Now, thinking of x as a function of y , sketch four (short and wide) approximating rectangles.
 - e) Continuing to think of x as a function of y , express the area of this region as a single definite integral.
 - f) Evaluate the integrals in c) and e). Did you get the same answer? (You should!)