Math 1203 Integrals Worksheet 1

Name(s): _____

Instructions: Calculators allowed. Save your scrap. Write your fully simplified answers in the space provided.

1. Compute the following integrals:

$(a)\ \int \left(\sqrt{x}+1\right)^2 dx =$ _____ $(b)\ \int x^2 e^{x^3+1}\, dx =$ _____

$(c)\ \int_{-1}^{1} \frac{x}{1+x^2} dx =$ _____ $(d)\ \int x \cdot 3^{x^2}\, dx =$ _____

$(e)\ \int (2x+1)(x^2+1)^2\, dx =$ _____ $(f)\ \int_0^2 x^3+1\, dx =$ _____

$(g)\ \int \frac{x^2+x+1}{x^2} dx =$ _____ $(h)\ \int_0^2 \pi\, dx =$ _____

$(i)\ \int \frac{1}{x(\ln x)^3} dx =$ _____ $(j)\ \int \frac{2^x}{1+2^x} dx =$ _____

2. Let $f(x) = 9 - x^2$.

   (a) Use a finite Riemann sum with 4 subintervals and righthand endpoints to approximate the area under $f(x)$ on [-1,3].
   $A \approx R_4 =$ _____

   (b) Find the exact area under $f(x)$ on the interval [-1,3]. Was your approximation an overestimate or underestimate?
   $A =$ _____ , the approximation was an _____.

   (c) An object has velocity function $f(t)$. What is the distance traveled between $t = 0$ to $t = 3$? _____

3. Find the area bounded by the functions $y = x^2$ and $y = \sqrt{x}$. $A =$ _____

4. Write down a formula, involving integrals, to compute the area bounded between $y = x^3 - x$ and the x-axis.

   $A =$ _____