Math 107H Practice problems for exam 1

Show all work. How you get your answer is just as important, if not more important, than the answer itself.

Note that "$\int_0^x f(t)\ dt + c$" as an answer to "Find the antiderivative of $f(x)$" will not get you much credit...

Find the following integrals:

1. $\displaystyle\int_0^1 (3x+1)^{2/3}\ dx$
2. $\displaystyle\int x(x+1)^{2/3}\ dx$
3. We know two different substitutions which will enable us to find the integral
$$\int \sec^4 x \tan^5 x\ dx\ .$$
Show how to do both.
4. $\displaystyle\int \frac{dx}{x\sqrt{x^2+1}}$
5. $\displaystyle\int \frac{x^2\ dx}{(x-2)(x^2+1)}$
6. $\displaystyle\int \text{Arcsin}(x)\ dx$
7. $\displaystyle\int \frac{x^2}{\sqrt{1-x^2}}\ dx$
8. $\displaystyle\int_0^1 \frac{x^2}{x^2+1}$
9. $\displaystyle\int_1^3 \frac{x}{(x+1)(x+5)}$

Solutions to (some of) these problems can be found on the class webpage, filed under "exams":

http://www.math.unl.edu/∼mbrittenham2/classwk/107f10/