1S3 (Timoney) Tutorial/Exercise sheet 9
[Tutorials April 2 – 13, 2007]

Name:

Student ID:

Find the following integrals analytically (that is with pencil and paper).

1. $\displaystyle\int \tan^6 x \, dx$

2. $\displaystyle\int \sec^4 x \, dx$

3. $\displaystyle\int \sqrt{(x+1)^2 - 4} \, dx$

4. $\displaystyle\int_{-2}^{-1} \frac{x}{x^2 + 4x + 5} \, dx$

5. $\displaystyle\int \frac{x+1}{(x-2)^2(x^2 + x + 2)} \, dx$

6. $\displaystyle\int \frac{x+1}{(x+2)(x+3)^2} \, dx$

7. $\displaystyle\int \frac{x^4 + 8x^3 + 21x^2 + 19x + 1}{x^3 + 8x^2 + 21x + 18} \, dx$

8. Find the following (improper) intergral, or show that it does not converge.

$$\int_1^\infty \frac{1}{\sqrt{x}} \, dx$$

Please hand in your work at your first tutorial in Trinity term. Due to Easter, this may be later than April 13th. You should work on the problems over the break and then at the tutorial you should be ready to ask about those that you got stuck on, or are not certain about.

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