

EE106 – Engineering Mathematics I

Problem Set 8

Due in tutorial on Thursday, 4 December 2014

1. Use the trigonometric substitution $x = a \tan(\theta)$ to do the following integral:

$$\int \frac{dx}{x^2 + a^2}$$

2. Use integration by parts (twice) to show that

$$\int_0^{\pi/2} x^2 \sin(x) dx = \pi - 2$$

3. Use the method of partial fractions to compute

$$\int \frac{x^2}{x^2 - 100} dx$$

4. Using whatever method you like, do the integral

$$\int \frac{dx}{x(\ln(x))^3}$$