

MAT 102 SPRING 2008
HINTS ON HOMEWORK 6

§7.4.

- **Q73.** Make a substitution first and apply the formula on p.530.

§8.1.

- **Q4.** Can you write $\csc^2 y dy$ as d of something? (This basically amounts to finding the anti-derivative of $\csc^2 y$.)
- **Q8.**

$$\frac{dx}{x - \sqrt{x}} = \frac{1}{\sqrt{x} - 1} \cdot \frac{dx}{\sqrt{x}}.$$

- **Q30.**

$$\frac{2dx}{x\sqrt{1-4\ln^2 x}} = \frac{1}{\sqrt{1-4\ln^2 x}} \cdot \frac{2dx}{x}.$$

- **Q32.** Let $r = 3 \sec x$. (Of course, if you remember the formula you can also use it directly...)
- **Q43-45.** List of useful trigonometric identities:

$$\tan x = \frac{\sin x}{\cos x}$$

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

$$\sin(2x) = 2 \sin x \cos x$$

$$\cos(2x) = 2 \cos^2 x - 1 = 1 - 2 \sin^2 x$$

$$\sin(3x) = 3 \sin x - 4 \sin^3 x.$$

(These are basically all the trigonometric identities that you will need for the course. The first two are essential; the third and the fourth are easy consequences of the first two and the definitions. I am afraid there is no easy way to remember the last three though, unless you learn something called 'the complex numbers'. We may touch upon that at a certain point, but not for now. By the way, these are just the identities without differentiation or integration; you will of course need to know the derivatives of these trigonometric functions.)