

# Study guide midterm no. 2

## Quantitative Analysis, 1100-1/2

Spring 2008, Arend Bayer

The midterm will cover sections 10.5–13.2 (but remember we skipped 11.4 and 12.5). About half of the midterm will be on derivatives and applications, the other half on anti-derivatives and integrals. A good check list for review are the "Key Terms and Formulas" at the end of each chapter. Also, you should go over the quizzes we had since the last midterm.

**You will be allowed to bring one sheet of paper with your own hand-written notes to the exam.**

### 1. RATIONAL FUNCTIONS

Good review exercises are 10.5.19–24. However, in the midterm there will probably only be a part of a problem like this, e.g. to find the intervals where a function is concave up or down.

### 2. DERIVATIVES INVOLVING EXPONENTIALS/LOGARITHMS

You need to remember the rules

$$\frac{d}{dx} \ln u(x) = \frac{u'(x)}{u(x)}$$

$$\frac{d}{dx} e^{u(x)} = e^{u(x)} u'(x)$$

and you should feel comfortable applying them.

2.1. **Exercises.** Review exercises 11.1–14 and 11.25–30 for applications.

### 3. IMPLICIT DERIVATIVES AND APPLICATIONS

There will most likely be one problem where you need to compute an implicit derivative as in review exercises 11.15–19, 11.21–22.

For the applications regarding elasticity, you obviously need to know the formula for  $\eta$ . Remember to compute  $\frac{dp}{dq}$  by taking the given equation and computing the implicit derivative  $\frac{d}{dq}$ , just as in the problems in section 11.3. From this you get a formula for  $\eta$  in terms of  $p$  and  $q$ . *Depending on the problem*, you might then just have to compute  $\eta$  from the given data, or make it a function of  $q$  by plugging in a given formula for  $p$ , etc. You can do the review exercises 11.37–39, or 11.5.1–12.

(We skipped the tax revenue applications in 11.5.)

### 4. ANTI-DERIVATIVES AND APPLICATIONS

You should go through all the formulas in sections 12.1–12.3. If you know all of them, you can do all the review exercises 12.1–26.

For applications, example 2 in 12.4 is a useful one to review, and review exercises 12.41–44 are typical problems.

## 5. COMPUTING AREAS AND THE DEFINITE INTEGRAL

We really did only parts of section 13.1. If you can do 13.1.1–4 and 13.1.29/31/32, you are good. Whenever you need a summation formula (as those on page 872), you will be given it in the problem.

For section 13.2, you can try any of 13.2.1–26 for practice. As applications, only simple computations of areas as in 13.2.33–40 will come up.