

# Homework 7

This homework is due in class on Friday 2/25/11

## 1 Course material

### Inequalities

Solve the inequalities in the following problem exactly using either a graphical method (studying with a signs table and sketching the function, and finding their intercepts) or a mathematical method (manipulating the inequalities directly). The method to use for each question is specified below.

Textbook Questions: Section 2.4: 16 (direct), 22 (direct), 12 (graphical), 32 (graphical), 39 (graphical), 44 (graphical), 54 (graphical), 52 (graphical), 58 (graphical)

### Power functions and properties of exponents:

- Textbook Appendix B3: 22, 26, 27, 28, 32, 50, 57, 58, 70, 74
- Textbook Section 5.1: 4, 6, 8, 10
- Find the inverse of the following functions:  $f(x) = 3x^{-2/3}$ ,  $g(x) = \frac{x^4}{81}$ ,  $h(x) = 2(x+1)^{2\pi}$

### Basic properties of exponential functions:

- Textbook Section 5.1: 20, 22, 26, 32
- Simplify:  $\frac{2^{x-1}}{4^{x+2}}$ ,  $\frac{3^{2x-1}}{27^{3-x}}$ ,  $\frac{(5^{2x-1})^{1/2}}{625^x}$

## 2 Applied Problems

Problem 38 page 314. After question (a), study the rational function  $S(r)$  using all the tools you know (i.e. find  $x$ -intercepts,  $y$ -intercepts, asymptotes, signs table, etc), then sketch the function by hand. In part (b) you will be able to check your answer.

Problem 35 page 321. You can check your answer against the one in the back of the book, but you need to explain how to obtain it step by step.

Problem 12 page 323. Your answer should be a function  $A(w)$ . You need to justify it step by step.