This review sheet is intended to cover everything that could be on the exam; however, it is possible that I will have accidentally left something off. You are still responsible for everything in the chapters covered except anything that I explicitly say you are not responsible for. Therefore, if I left something off of this sheet, it can still be on the exam. There will be no multiple-choice questions. Most of the questions will be like the ones in the homework assignments, and possibly a few definition questions, but I am more likely to ask questions that make you use the definitions rather than recite them. I will probably ask one of the questions from the book at the end of the chapters.

The review session will be at a time to be determined, probably Thursday, 1/30 in the normal room.

Chapter 1: What are **exogenous variables, endogenous variables, parameters, relationships, equilibrium, statics,** and **dynamics**?

Chapter 2.1: Understand was **sets, subsets,** and **elements** are. Understand set notation and the symbols $\in$**,** $\subset$**,** $\supset$**,** $\subseteq$**,** $\supseteq$**,** $\not\subset$**,** $\not\supset$**,** $\not\subseteq$**,** $\not\supseteq$**,** and $\notin$. Know what $\Leftrightarrow$ means. Be able to draw and interpret **Venn diagrams**. What is the symbol for the **empty set**, a.k.a. **null set**? Know how to find the sets for $\cap$ and $\cup$. What are **disjoint sets**? What is the symbol for the **complement set**? Be able to find the **relative difference of two sets**. Be able to recognize a **partition of a set**.

Chapter 2.2: Now what the following sets are: **Z, Z_+, Q,** $\Re$**,** $\Re_+$, and $\Re_{++}$. Know the following properties of real numbers: **closure, commutative laws for + and *, associate laws for + and *, distributive law, the properties of zero and one, negation, reciprocals, completeness, transitivity, reflexivity,** and **equality.** Knowing the **dimensions** (**units**) of economic variables will help you to write equations which make economic sense.

Chapter 2.3: Know how to plot an **ordered pair** on the **coordinate system (Cartesian Plane).** Know how to do a **Cartesian product** like $\{1, 2, 3\}\otimes\{4, 5, 6, 7\}$. Be able to show intervals on a number line like, [1, 4), (-∞, 7], etc. Know the difference between an **open interval, closed interval**, and **half-open interval**. What do **bounded** and **compact** mean? Know how to tell if a set is **convex**. (A line connecting two points is entirely in the set.) Memorize the **Euclidian distance formula** (which is easier than it looks.) Know what an **ε-neighborhood** is. Note that the definitions of a **boundary point**, **interior point**, and **convex set** easier than they look.

Chapter 2.4: Know what **function, domain, range, image,** and **value** are. Be able to tell if the function is **one-to-one, onto,** and/or **one-to-one correspondence.** (The former is the vertical line test, while the middle one is the horizontal line test, and the latter is both tests.) When is a function **invertible**? Know what a **composite mapping** is. Know what is meant by **slope coefficient** and **intercept term** in a **linear function**. An **implicit function** is basically f(X, Y)=0. *(Y is a function of X, but it is not explicitly written out.)* Know that **quadratic** functions have a maximum or minimum at x = -b/2a where $Y = aX^2 + bX + c$. **Rectangular hyperbolas** are of the form XY=α.. Know how to plot **power functions** ($Y = aX^b$) and **exponential functions** ($Y=a*b^X$). Know what **logarithmic functions** are including the **natural log**. Note that for all bases (including e so it applies to the natural log ln) that $\log_b(X*Y)= \log_b(X)+\log_b(Y)$ which means $\log_b(X^a) = a*\log_b(X)$ and $\log_b(X/Y) = \log_b(X)-\log_b(Y)$. The definitions of **concave** and **convex** are fairly simple (concave looks like a cave so all points on the **secant** are below the line.). Putting **strictly** in front of them means the equality does not hold. For **quasi-concave**, the **better set** of the isobar (level curve) is convex. For **quasi-convex**, the **worse set** of the isobar (level curve) is convex. Note that the **Cobb-Douglas** function $f(X,Y)=X^aY^b$ normally uses the assumption that a+b<1.

Chapter 3.1-3.2: A **sequence** is a succession of numbers of the form f(1), f(2), f(3), . . . like $f(n) = n^2$ where $n \in Z_+$ or $a_1, a_2, a_3, \ldots$ Know how to tell if it has a **limit**. (For a n >N, $|a_n - L| <\varepsilon$ for an arbitrarily small ε.) If there is no limit, it is **divergent**. **Definitely divergent** if the limit is ∞ or -∞. It is **bounded**

if there is a range the values do not exceed for large n. ($|a_n|<K$).

Chapter 3.3: Understand why $PV=FV_t/(1+r/n)^{nt}$ for **discrete compounding** and $FV_t = PV*e^{rt}$ or $PV = FV_t e^{-rt}$ for **continuous compounding**. There will be more of this in Chapter 3.5.

Chapter 3.4: The limits of sequences have nine properties which are very intuitive on Pages 79 and 81. **Monotonically increasing** and **monotonically decreasing** are exactly what you would expect. It is **bounded** if there is both an upper bound and a lower bound.

Nongraded Homework #2A to be reviewed with Homework #2.

1) (15 points each) For each of the following, plot the first 6 points of the sequence. Determine if is bounded and determine if it has a limit. Explain your logic.
A) $F(n) = 16*(2^{-n})$
B) $F(n) = 3 -1^n$
C) $F(n) = -2^n$

2) (10 points) Find $\lim_{n\to\infty}\left(\frac{7+\frac{5}{n}}{3-\frac{6}{n^2}}\right)$

3) (10 points) Find $\lim_{n\to\infty}\left(\frac{n^2+3n+6}{4n^3+8n-8}\right)$

4) (10 points) Find $\lim_{n\to\infty}\left(\frac{n^2+3n+6}{4n^2+8n-8}\right)$

5) (10 points) Find $\lim_{n\to\infty}\left(\frac{n^2+3n+6}{8n-8}\right)$

6) (5 points each) Write the formula for the present value of each of the following. Briefly explain how you got each one.
A) $5000 paid in 6 years, with 6% interest compounded monthly.
B) $1000 paid in 3 years with 10% interest compounded continuously.
C) $600 paid in 4 years with 5.2% interest compounded weekly.