# Review Sheet for Math 151 Exam 3

**The Exam will cover Section 4.2 through Section 5.7 (excluding Sec 4.7, 5.4, and 5.6). The following is a summary of the material to be covered on the exam.**

- **Section 4.2**
  - **Determine if a function is one-to-one**
  - **Find the inverse function**
  - **Calculate the derivative of the inverse at a point without finding the inverse function.**
- **Section 4.3**
  - **Properties of Logarithmic Functions**
  - **Limits of Log Functions**
  - **Definition for log function in terms of the natural log**
- **Section 4.4**
  - **Derivative Rules**

- **Logarithmic Differentiation**

- **Section 4.5**
  - **"The Differential Equation"**
  - **The Solution to "The Differential Equation"**
  - **Growth/Decay Problems**
  - **Newton's Law of Cooling Problems**

- **Section 4.6**
  - **The Restrictions**
  - **The Inverse Functions**
  - **The Cancellation Equations**
  - **The Derivatives**

- **Section 4.8**
  - **Indeterminate Quotients**
  - **L'Hospital's Rule**
  - **Other Indeterminate Forms**
- **Section 5.1**
  - **What does $f'$ say about $f$?**
  - **What does $f''$ say about $f$?**
  - **Local Max/Min**
  - **Inflection Point**
  - **Do the Derivatives Drill for practice!!**
- **Section 5.2**
  - **Absolute Max/Min**

- **Local Max/Min**

- **Extreme Value Theorem**

- **Critical Number**

- **Fermat's Theorem**

- **Closed Interval Method**

- **Section 5.3**
  - **The Mean Value Theorem**

  - **Increasing/Decreasing Test**

  - **First Derivative Test**

  - **Concavity Test**

- **Second Derivative Test**

- **Section 5.5**
  - **Work through the Applied Max/Min Problems**

- **Section 5.7**
  - **Antiderivatives**
    - **Scalar Functions**

    - **Vector Functions**