

Math 151 Study Guide for Exam 2

Definitions You Should Know

Implicitly Defined Curve

Second Derivative (and Third, Fourth, n^{th} , etc.)

Differential

Linearization

Critical Number

Increasing/Decreasing

Absolute Maxima/Minima

Local Maxima/Minima

Interesting Number (In class, this is what we called any x - value where $f''(x) = 0$ or does not exist.)

Concave Up/Down

Inflection Point

Limit at Infinity

Notation You Should Know

$$\frac{d^2y}{dx^2}, f''(x)$$

$$D^{(n)}(x)$$

$$\frac{dx}{dt}, \text{ where } t \text{ is a measurement of time.}$$

$$dy, \Delta y$$

Calculations You Should Know How To Do

Find the tangent lines to implicitly defined curves.

Find higher derivatives of ordinary functions.

Sketch the derivative and second derivative of a function from a graph of the function.

Find higher derivatives of implicitly defined curves.

Related rates problems.

Find the differential of a function.

Find the linearization of a function.

Use the differential or linearization to estimate values of a function.

Find critical numbers of a function.

Find the intervals of increase and decrease of a function.

Find the local and absolute maxima and minima of a function from its equation.

Find the local and absolute maxima and minima of a function from its graph.

Use the graph of $f'(x)$ to determine where $f(x)$ is increasing/decreasing, concave up/down, has a local max/min, etc.

Optimization Problems

Find Interesting numbers of a function.

Find the intervals of concave up and down of a function.

Use the graph of $f''(x)$ to determine where $f(x)$ is increasing/decreasing, concave up/down, has an inflection point, etc.

Find $\lim_{x \rightarrow \infty} f(x)$.