

Math 1210-02 Chapter 5 Test Review

About the test: No notes. No calculators. No cell phones. You must show your work to get credit. Simplify your answers as far as possible. Points are taken off for labeling errors. Seating is every other column.

What to study

- increasing/decreasing, concavity, critical points, inflection points, relative and absolute extrema
- sketching curves
- Match the IVT, Extreme Value Theorem, Rolle’s Theorem, and MVT with their statements and paraphrased versions
- find extrema
- do applied optimization problems
- set up Newton’s Method and do initial step after using IVT (Newton’s Method formula provided)
- speed problems using MVT
- analyzing rectilinear motion using graphs and equations

Extra Credit Review Problems (10 points) Due at the beginning of the test.

A. Fill in the table:

	+	0	-
$f'$			
$f''$			

B. Give the following for the graph of  $f$  below. If the item does not exist, so state. Estimate if necessary.

	<p>a) interval(s) where <math>f</math> is increasing _____</p> <p>b) interval(s) where <math>f</math> is concave down _____</p> <p>c) inflection point(s) as ordered pair(s) _____</p> <p>d) relative (local) maximum(s) as ordered pair(s) _____</p> <p>e) relative (local) minimum(s) as ordered pair(s) _____</p> <p>f) absolute (global) maximum(s) as ordered pair(s) _____</p> <p>g) absolute (global) minimum(s) as ordered pair(s) _____</p> <p>h) critical point(s) as ordered pair(s) _____</p>
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C. Match the IVT, Extreme Value Theorem, Rolle’s Theorem, and MVT with their paraphrased versions:

- Given two  $y$ -values, the function does not skip any  $y$ -values between them.
- The slope of some tangent line of  $f$  equals its average rate of change.
- Somewhere between two  $x$ -intercepts, a function has a horizontal tangent line.
- A function has an absolute maximum and an absolute minimum on a closed interval.

D. Fill in the table: **When  $f'$  is 0 at a point**

	$f'$	$f''$
max		
min		
neither		

- 5.1: 14  
 5.2: 41, 48  
 5.4: 13,19,22  
 5.5: 5,11,19  
 5.6: 2 (first step only, use IVT), 7 (first step only, use IVT)  
 5.7: 19,41  
 5.8: no problems assigned since you’ve just done the homework