Math 116 — Practice for Exam 1

Generated January 9, 2017

Name: **SOLUTIONS**

Instructor: _____ Section Number: _____

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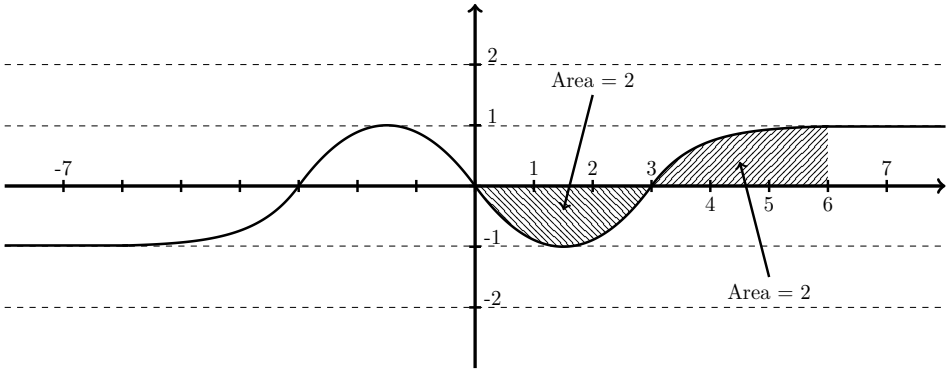
1. This exam has 4 questions. Note that the problems are not of equal difficulty, so you may want to skip over and return to a problem on which you are stuck.
2. Do not separate the pages of the exam. If any pages do become separated, write your name on them and point them out to your instructor when you hand in the exam.
3. Please read the instructions for each individual exercise carefully. One of the skills being tested on this exam is your ability to interpret questions, so instructors will not answer questions about exam problems during the exam.
4. Show an appropriate amount of work (including appropriate explanation) for each exercise so that the graders can see not only the answer but also how you obtained it. Include units in your answers where appropriate.
5. You may use any calculator except a TI-92 (or other calculator with a full alphanumeric keypad). However, you must show work for any calculation which we have learned how to do in this course. You are also allowed two sides of a $3'' \times 5''$ note card.
6. If you use graphs or tables to obtain an answer, be certain to include an explanation and sketch of the graph, and to write out the entries of the table that you use.
7. You must use the methods learned in this course to solve all problems.

Semester	Exam	Problem	Name	Points	Score
Winter 2011	1	2		17	
Winter 2010	1	7		7	
Fall 2010	1	2		11	
Winter 2012	1	4		10	
Total				45	

Recommended time (based on points): 41 minutes

2. [17 points]
The graph of an odd function f is shown below.



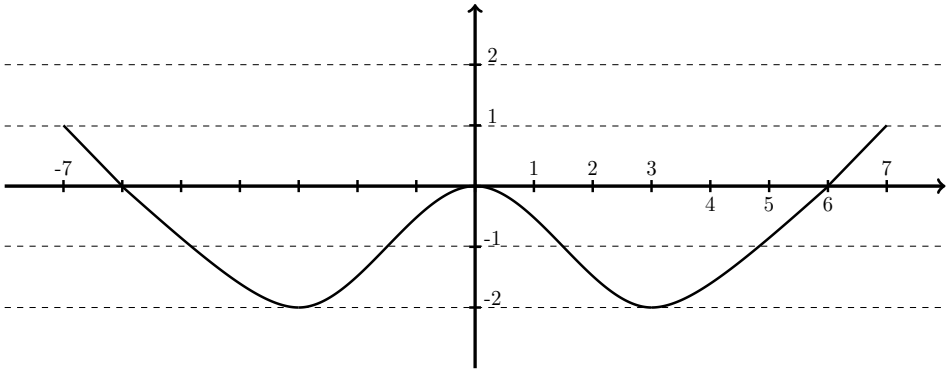
a. [7 points] Let $F(x)$ be the antiderivative of $f(x)$ with the property that $F(3) = -2$. Use the graph of $f(x)$ to compute the following values of $F(x)$.

x	-7	-6	-3	0	3	6	7
$F(x)$							

Solution:

x	-7	-6	-3	0	3	6	7
$F(x)$	1	0	-2	0	-2	0	1

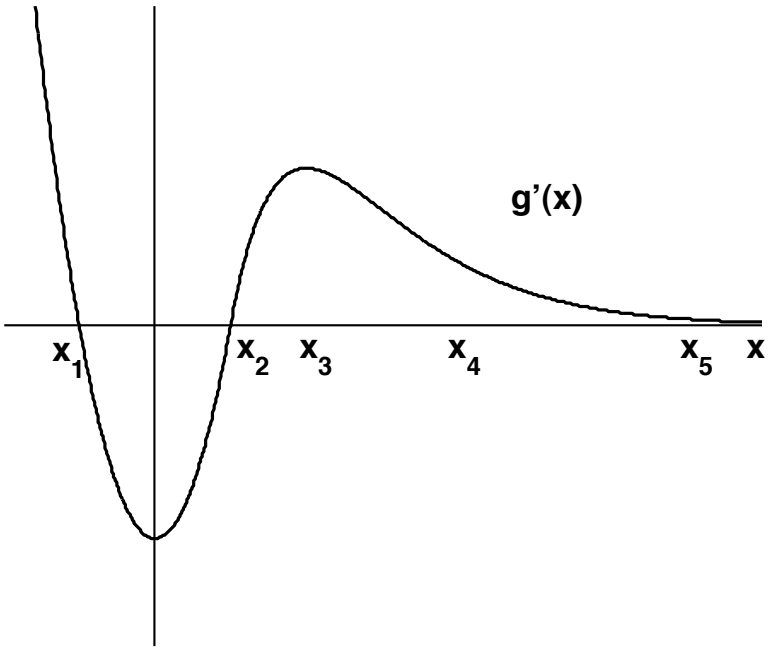
b. [8 points] Sketch the graph of $F(x)$ from $x = -7$ to $x = 7$. **Label all points of inflection**.



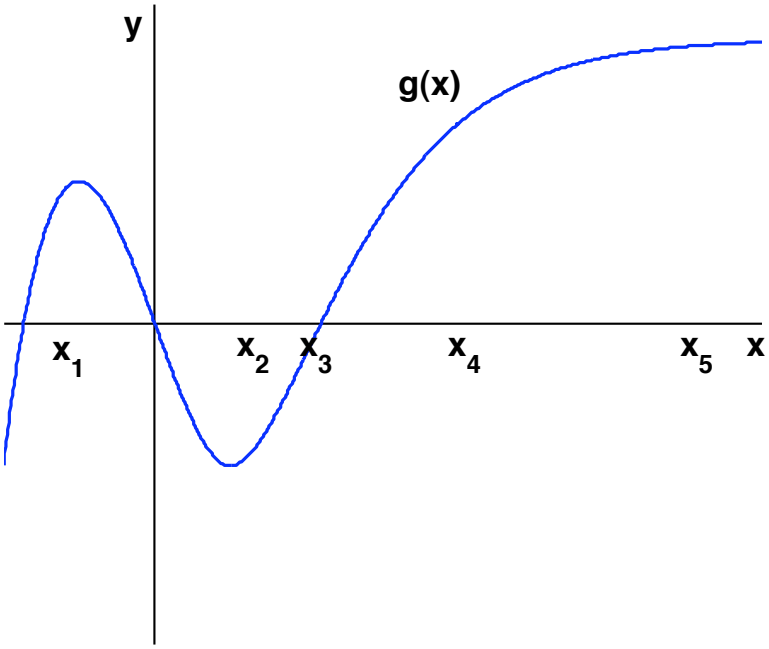
c. [2 points] Calculate the average value of f between $x = -3$ and $x = 7$.

Solution: $\frac{1}{7-(-3)} \int_{-3}^{7} f(x)dx = \frac{3}{10}$

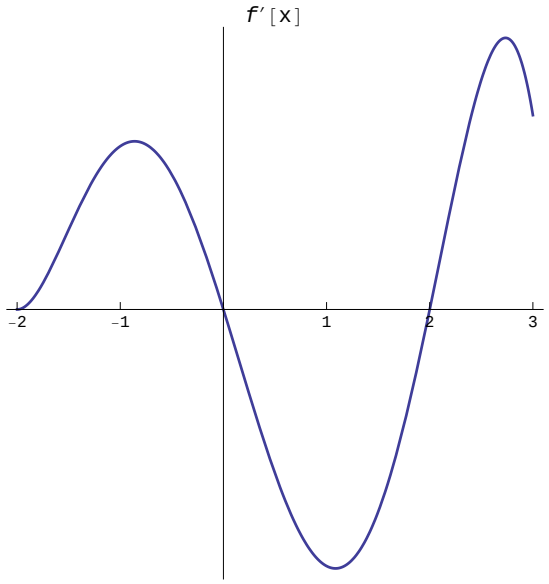
7. [7 points] Given is a graph of $g'(x)$. Sketch a graph of $g(x)$ on the provided axes given that $g(0) = 0$ and $g(x)$ is continuous. On your graph, label any local maxima, minima, and points of inflection.



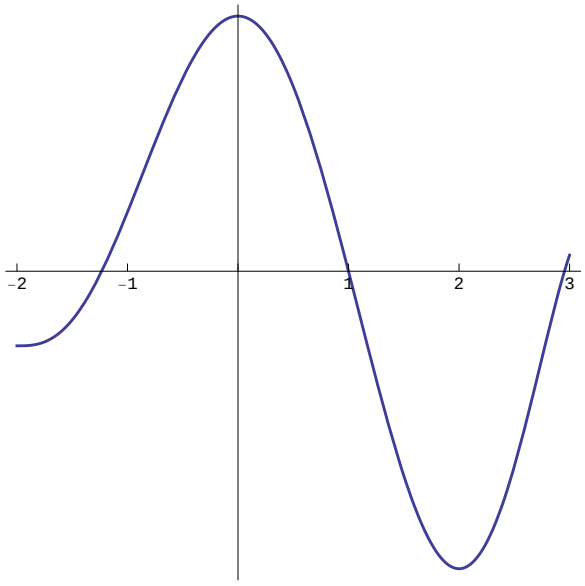
Solution:



2. [11 points] Given the graph of $f'(x)$. Sketch a graph of $f(x)$ on the provided axes given that $f(1) = 0$. On your graph, label any local maxima, minima, and points of inflection. Make sure that the concavity of the graph of $f(x)$ is visible in your graph.

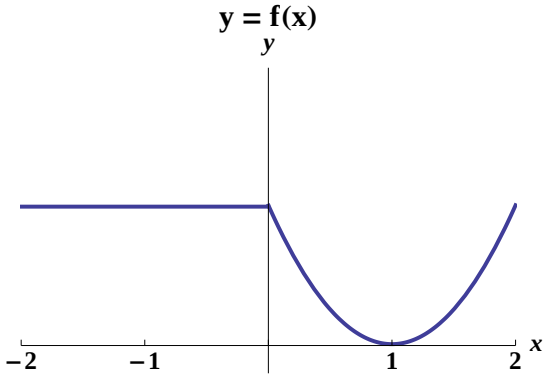


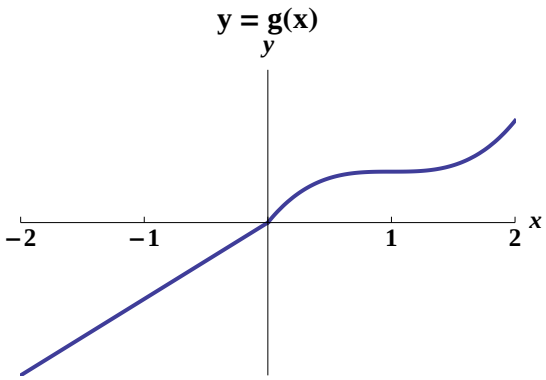
Solution:
$x = 1$, x-intecept
$x = 0$ local max
$x = 2$ local min
$x = -1, 1, 2.8$ points of inflections
$(-2, -1)$, $(1, 2.8)$ concave up
$(-1, 1)$,$(2.8, 3)$ concave down



4. [10 points] Given the graph of $f(x)$, sketch the graph of $g(x)$. Make sure your graph accurately shows the intervals where $g(x)$ is increasing or decreasing and its concavity.

a. [5 points] Let $g'(x) = f(x)$ with $g(0) = 0$.





b. [5 points] Let $g(x) = \int_1^x f(t)dt$.