Math 1151, Final Exam
Monday May 10, 1:30pm-4:30pm

Name: _____ **ID #:** _____

Signature: _____

Lecturer: _____

Discussion TA: _____ **Section:** _____

Instructions:

1. This booklet contains 14 pages, including this cover page. Put your name on the top of each page, in case the pages become separated.
2. This exam has 10 multiple-choice problems, each worth 5 points. When you have decided on a correct answer to a given question, circle the answer in this booklet *and* fill in the appropriate bubble on your answer sheet. There is no partial credit for the multiple-choice problems.
3. This exam has 7 open-ended problems, whose point-values are given in the problem. All together the open-ended problems are worth 100 points. Make sure to show all your work and circle your final answer.
4. This exam is closed book and closed notes. You may use a scientific calculator but not a graphing calculator.

Question	Points
11	
12	
13	
14	
15	
16	
17	
1-10	
Total	

Sum and Difference Formulas

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\cos(\alpha-\beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$$

$$\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$

Double-angle Formulas

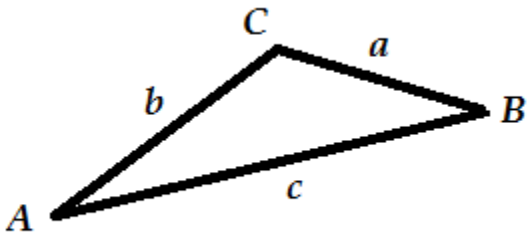
$$\sin(2\theta) = 2\sin\theta\cos\theta$$

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

$$\cos(2\theta) = 2\cos^2\theta - 1$$

$$\cos(2\theta) = 1 - 2\sin^2\theta$$

Convention for triangles



For all of the problems involving triangles, we use the following convention. The three sides have length a, b, and c, and the three angles have measure A, B, and C. The angle of measure A is opposite the side of length a, and likewise for B and b, C and c.

To *solve a triangle* means to find the lengths of its sides and the measurements of its angles. It is possible that the given information may result in one triangle, two triangles, or no triangles at all. In this case, to *solve the triangle* means to determine whether the given information results in one triangle, two triangles, or no triangles, and to solve any triangles that result.

Finite Sums of Arithmetic and Geometric Sequences

$$\sum_{k=1}^{n}\left(a_1+(k-1)\,d\right) = \frac{n}{2}(a_1+a_n)$$

$$\sum_{k=1}^{n} a_1\,r^{k-1} = a_1\left(\frac{1-r^n}{1-r}\right)$$