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Math 114, Lecture 1

Exam # 3

November 24, 2003

YOUR NAME: \_\_\_\_\_

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Do all six problems. Each part is worth the indicated number of points. There are 100 points altogether. Do not spend too much time on any one problem. There are eight printed pages in this exam, including this cover page.

Page	Possible points	Your score
Page 2	16	
Page 3	14	
Page 4	14	
Page 5	15	
Page 6	15	
Page 7	10	
Page 8	16	
<b>TOTAL</b>	<b>100</b>	

**Problem 1 continued:**

(d) (6 points) Use the information from part (c) to find the exact value of  $\cos\left(\frac{\varphi}{2}\right)$ .

(e) (4 points) Use the information from parts (a) and (c) to find the exact value of  $\sin(\theta - \varphi)$ .

(f) (4 points) Use the information from parts (a) and (c) to find the exact value of  $\tan(\theta + \varphi)$ .

**Problem 3**

(a) (5 points) Find **all** solutions to the equation  $\tan(3\theta) = -\sqrt{3}$ .

(b) (5 points) Find the solutions to the equation  $2\cos^2(x) = 3\sin(x) + 3$  which lie in the interval  $0 \leq x \leq 2\pi$ .

(c) (5 points) Find the solutions to the equation  $\sin(2t) = \sin(t)$  which lie in the interval  $0 \leq x \leq 2\pi$ .

**Problem 5** (10 points) Verify the following identity:

$$\frac{2}{\tan(x) + \cot(x)} = \sin(2x)$$