

Math 113    Carter    Test 3    Fall 2003

Write your name on only the outside of your blue book. Do not write on this sheet. Write neat careful solutions to each of the following 10 problems. Each counts 10 points. Be careful. Good Luck.

1. Simplify  $\sin(A + B) - \sin(A - B)$ .

2. Use the facts that  $\sin\left(\frac{\pi}{12}\right) = \frac{\sqrt{2-\sqrt{3}}}{2}$  and  $\cos\left(\frac{\pi}{12}\right) = \frac{\sqrt{2+\sqrt{3}}}{2}$  to determine the values of the six trigonometric functions at the angle  $\frac{5\pi}{12}$ .

3. Verify the identity:

$$\frac{1 - \cos x}{\sin x} = \frac{\sin x}{1 + \cos x}$$

Hint: Use the Pythagorean Theorem.

4. Verify the identity:

$$\frac{\sin x + \cos x}{\sec x + \csc x} = \frac{\sin x}{\sec x}$$

5. Compute the exact value of  $\text{Arccot}(-\sqrt{3})$  as an angle in radians.

6. Evaluate  $\arcsin(\cos(\frac{5\pi}{6}))$

7. Use the graphing capabilities of your calculator to approximate the solutions (that are in the interval  $[0, 2\pi]$ ) to the equation:

$$x \cos x - 2 = 0$$

8. Find all solutions for  $0 \leq x < 2\pi$ ,

$$3 \sin^2 x = 3 \sin x + 2$$

9. Solve the triangle, if possible:  $A = 131^\circ$ ;  $C = 23^\circ$ ;  $b = 10$

10. Solve the triangle, if possible:  $C = 28^\circ 43'$ ;  $a = 6M$ ;  $b = 9M$