Name ______________________ Rec. Instr. ______________________

Rec. Time ______________________

PLANE TRIGONOMETRY

Exam III
November 3, 2005

Page 1 (10 pts.)	**Page 2** (30 pts.)	**Page 3** (30 pts.)	**Page 4** (30 pts.)	**TOTAL** (100 pts.)

Below you will find 10 problems, each worth 10 points. Solve the problems in the space provided. When writing a solution to a problem, **show all work**. No books or notes are allowed. **Sign and submit your formula sheet with the exam.**

Problem 1. A triangle ABC has $a = 2$ in, $b = 3$ in, and $\widehat{A} = 30°$. Find the remaining parts: $\widehat{B}$, $\widehat{C}$, and c. (Express all angles in degrees. Round to two decimal places.)

Problem 2. A triangle ABC has $a = 10$ in, $\widehat{B} = 60°$ and $\widehat{C} = 45°$ in. Find the remaining parts: $\widehat{A}$, b, and c. (Express all angles in degrees. Round to two decimal places.)

Problem 3. Suppose α and β are **acute** angles with $\sin\alpha = \dfrac{3}{5}$ and $\cos\beta = \dfrac{5}{13}$. Find the **exact** values of $\sin(\alpha+\beta)$ and $\cos(\alpha+\beta)$.

Problem 4. Verify the identity: $\dfrac{\sin 3t - \sin t}{\cos t + \cos 3t} = \tan t$.

Problem 5. Find the **exact** values of $\sin\dfrac{5\pi}{12}$ and $\cos\dfrac{5\pi}{12}$. (The **exact** values should be written using radicals.)

Problem 6. Find **all** solutions of the equation: $\sin 5t - \sin 3t = 0$. (HINT: factor LHS.)

Problem 7. Given θ in Quadrant III, and $\cos\theta = -\dfrac{8}{17}$, find the **exact** value of $\tan(\theta/2)$.

Problem 8. Given $3\pi/2 < \theta < 2\pi$, and $\sec\theta = 3$, find the **exact** values of $\sin 2\theta$ and $\cos 2\theta$.

Problem 9. Find the **exact** value of $\tan\left[\arccos\left(-\dfrac{12}{13}\right)\right]$.

Problem 10. Find the solutions of the equation $\tan^2 x - 2\tan t - 4 = 0$, that are in the interval $\left(-\dfrac{\pi}{2}, \dfrac{\pi}{2}\right)$. Round to nearest tenth of a radian.