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PLANE TRIGONOMETRY
EXAM III
July 13, 2007

There are 10 questions and each worth 10 points. Solve the problems in the space provided. **Show all your work for full points**. Sign and submit your formula sheet with the exam.

1. Solve for ΔABC where $\alpha = 29.7^\circ$, $a = 10.5$, $b = 15.2$.

2. To determine the distance between two points A and B, a surveyor chooses a point C that is 375 yards from A and 530 yards from B. If angle $\angle$BAC has measure $49^\circ 30'$, approximate the distance between A and B.

3. Approximate the area of ΔABC where $\alpha = 35.7^\circ$, $\gamma = 105.2^\circ$, $b = 17.2$.

4. A ship leaves port at 1.00 PM and travels $S35^\circ E$ at a rate of 24mi/hr. Another ship leaves the same port at 1.30 PM and travels $S20^\circ W$ at 18mi/hr. Approximately how far apart are the ships at 3.00 PM.

5. Express the complex numbers $z_1 = 2\sqrt{3} + 2i$ and $z_2 = \sqrt{3} - i$ in trigonometric form with $0 \le \theta \le 2\pi$. Hence find $z_1 z_2$.

6. Find the solutions of the equation $x^3 + 2 = 0$ and represent it in the Complex plane.

7. Let **a** = -5**i** + 2**j** and **b** = **i** - 3**j**, Find the vectors corresponding to 2**a**, -3**a, a**-3**b**, and 2**a** + **b** then sketch them in the *xy*-plane**.**

8**.** If **a**=<6, -2> and **b**=<1, 3>. Find each of the following,

(a) **a.**(**a+b**)

(b) The angle between **a** and **a+b**

9. Find the equation of the straight line that passes through the point A(4,5) and perpendicular to the line $3x+2y=1$.

10. Find the the equation of the straight line that passes through the points A(-2,7) and B(-3,-1). Hence find the y-intercept.