Name _____ Rec. Instr. _____

Rec. Time _____

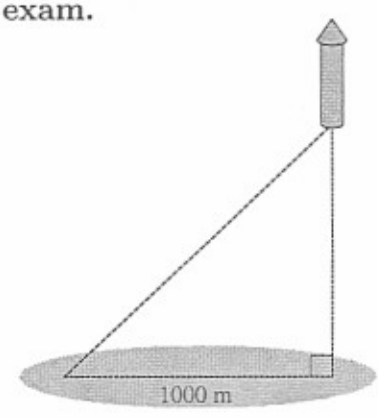
PLANE TRIGONOMETRY

Exam II
October 6, 2005

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

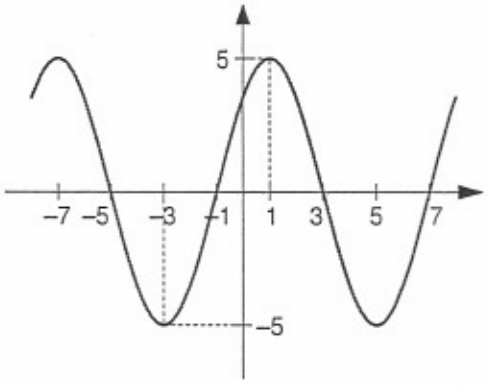
Below you will find 10 problems, each worth 10 points. Solve the problems in the space provided. When writing a solution to a problem, **show all work**. No books or notes are allowed. **Sign and submit your formula sheet with the exam.**

Problem 1. A rocket, flying on a straight vertical trajectory, is observed from a point positioned 1000 meters away from the launch site. During the final minute of flight, the angle of elevation of the rocket (measured from the observation point) changed from 64° to 78°. How long was the flight path of the rocket during this period? Approximate your answer to the nearest tenth of a meter.



Problem 2. The graph of the equation $y = a\sin(bx + c)$, with $a > 0$ and $b > 0$, is shown in the figure below.

(a) Find the amplitude and the period.



(b) Find the coefficients a, b and c.

Problem 3. Find the amplitude and the period for the curve $y = 4\sin\left(2x + \frac{\pi}{3}\right)$.

Problem 4. Verify the identity: $(\csc\theta - \cot\theta)(1 + \sec\theta) = \tan\theta$.

Problem 5. Find **all** solutions of the equation: $\sin\left(4x + \frac{\pi}{3}\right) = \frac{1}{2}$. Use **exact** values.

Problem 6. Find the **exact** values of $\sin\left(\frac{23\pi}{3}\right)$ and $\cos\left(\frac{23\pi}{3}\right)$.

Problem 7. Find the solutions of the equation $4\cos^2 t - 4\cos t - 3 = 0$, that are in the interval $[0, 2\pi)$. Use **exact** values

Problem 8. Verify the identity: $\cos x + \sin x \tan x = \sec x$.

Problem 9. Given the triangle $\triangle ABC$, with $\hat{C} = 90°$, $a = 3$ cm, and $b = 2$ cm, find the remaining elements of the triangle: the side c, and the angles $\hat{A}$ and $\hat{B}$. (When computing the angles, express them in degrees, rounded to the nearest tenth.)

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