MATH 121 **HOUR TEST I** **September 25,1996**

Name (print) ____________________________________

You **must** sign this sheet and turn it in with your text booklet. There are 6 questions on this text.

1. (10 points) Give the exact alues of the following trigonometrical expressions:

$$\text{(i)}\sin\left(-\frac{\pi}{6}\right)\text{(ii)}\cos\left(\frac{\pi}{6}\right)\text{(iii)}\tan\frac{4\pi}{3}\text{(iv)}\cos 3\pi\text{(v)}\sec\frac{5\pi}{4}$$

2. (20 points) A vertical tower standing on level ground is 123.7 feet tall. ¿From a point P on the ground, the angle of elevation of the top of tower is $51.23°$.

   a) Find the distance from P to the point of the base of the tower directly under its top.

   b) Find the distance rom the point P to the top of the tower.

3. (15 points) A flywheel is turning at the rate of 1500 revolutions per second. Points on its rim are moving at the linear speed of 300 feet per second. What is the radius of the flywheel? Give an approximate decimal answer in feet, accurate to 3 decimal places.

4. (20 points)

   a) Write an equation for the straight line passing through the points $(-1, 2)$ and $(2, 3)$.

   b) Write an equation for the straight line passing through the point $(2, 1)$ which is parallel to the line given by $2x - 3y = 8$.

   c) Find the slope intercept form of the equation of the line passing through the point $(2, 1)$ which is perpendicular to the line given by $2x - 3y = 8$.

5. (20 points)

   a) Find all real solutions to the equation $4x^2 = 4x + 3$.

b) Find all real numbers which exceed their reciprocals by 1. give both an exact answer and a decimal approximation accurate to 3 decimal places.

6. (15 points) Find all real solutions to the equation $x = \sqrt{x + 3}$.