Math 30 Sec 4 EXAM I 18 September 2002

Name: _____

I pledge that I have neither given nor received any unauthorized assistance on this exam.

_____
(signature)

DIRECTIONS

1) Print your name and sign the honor pledge above. If the pledge is not signed, your exam will ***not*** be graded.

2) Check now that your test contains all ***5 pages*** and ***7 problems***.

3) You may use a calculator (except symbolic manipulators such as a TI-89, TI-92, or similar), but your answers must be given in their ***exact*** form. (i.e. $\sqrt{3}$ and not 1.73, π and not 3.14)

4) All work must be shown on this exam. ***No credit will be given for a correct answer without supporting work that leads to the answer***. When it is indicated that calculators are not to be used, clear non-calculator work must be shown.

5) Place ***all*** of your final answers in the boxes provided. Include units when necessary. Always simplify and rationalize the denominator.

6) Notation and clarity count. Your job is to communicate mathematically; make what you are thinking clear.

7) Work quickly but thoroughly through the test. If you get stuck on a problem, move on to the next and return to it later after you've completed the problems you know how to do. ***Good Luck.***

(3 points each) 1. Convert the following angles from degrees to radians or from radians to degrees:
(a) $\frac{\pi}{6}$ (b) -215° (c) $\frac{4\pi}{9}$

(a)

(b)

(c)

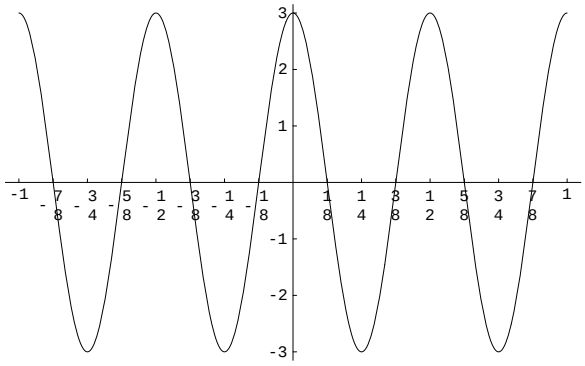
2. Without using a calculator, find the exact values of:
(5 points) (a) $\sin(-45^\circ)$ (5 points) (b) $\cot(\frac{2\pi}{3})$ (8 points) (c) $\cos^2(4\pi - \frac{\pi}{4}) + \tan(\frac{2\pi}{3})$

(a)

(b)

(c)

(12 points) 3. Give two equations of a sinusoidal curve with the following graph, one of the form $y = A\cos(\omega x - \phi)$ and one of the form $y = A\sin(\omega x - \phi)$.



(12 points) 4. If the minute hand on a watch is 3 cm long, how far does the tip of the minute hand travel in 35 minutes?

5. A wire 15 cm long is cut into two pieces. One piece is bent into an equilateral triangle while the other is formed into a circle.
(12 points) (a) Express the area, A, enclosed by the figures as a function of x, the length of one of the sides of the triangle.

(4 points) (b) What is the domain of A?

(6 points each) 6. If $\csc\theta = 8$, find the exact values of:
(a) $\cot^2\theta$ (b) $\sec(\frac{\pi}{2} - \theta)$ (c) $\sin\theta$

(a)
(b)
(c)

(15 points) 7. Given that $\sec\theta = -\frac{5}{2}$ and $\tan\theta > 0$, find the exact values, without using a calculator, of the remaining 5 trigonometric functions for θ.