

SHOW ALL WORK. NO CREDIT for answers only

- Give exact answers whenever possible, otherwise give answers accurate to two decimal places. Sketch any calculator graph you use including the axes with a scale.
- Turn in this sheet with your test booklet. Write your TA's name and your discussion time on the booklet. BE SURE YOUR CALCULATOR IS SET TO THE RIGHT MODE, DEGREES OR RADIANS.

1. (16 pts) Give the EXACT value of the following trigonometrical expressions:

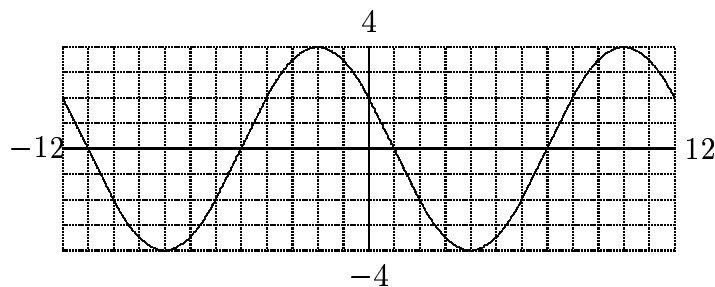
(a) $\sin\left(\frac{5\pi}{3}\right)$ (b) $\csc\left(-\frac{\pi}{2}\right)$ (c) $\sin\left(\frac{7\pi}{12}\right)$ (d) $\tan\left(\frac{3\pi}{4}\right)$

2. (16 pts) Which of the following statements are identities? For each one, state TRUE or FALSE. If FALSE, give a brief explanation.

(a) $\sin^2(x) + \cos^2(x) = 1$ (b) $\cos(-x) = -\cos(x)$
 (c) $\sec^2(x) + \csc^2(x) = 1$ (d) $\sin\left(x - \frac{\pi}{2}\right) = \cos x$

3. (16 pts) (a) Find a possible formula for the sinusoid whose graph is shown here and use your formula to answer the following questions:

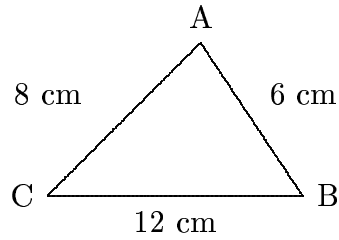
- (b) What is the period?
 (c) What is the amplitude?
 (d) What is the phase shift?



4. (14 pts) If $\cot(\theta) = -\frac{3}{2}$ and $\cos(\theta) < 0$, find:
 (a) $\cos \theta$. (b) $\sin \theta$.

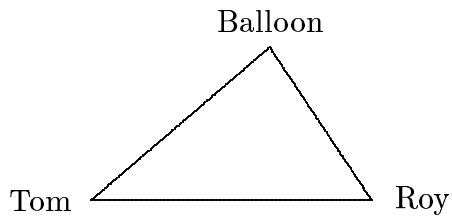
There are 3 more questions on the reverse side.

5. (14 pts) For the figure given,



- (a) Find the angle A in degree.
- (b) Find the area of the triangle.

6. (12 pts) Two observers, Tom and Roy, 3 miles apart see a hot-air balloon directly between them with Tom's angle of elevation of 28° and the Roy's angle of elevation of 37° .



Find the altitude of the balloon.

7. (12 pts) A riding lawn mower has wheels that are 16 inches in diameter. If the lawn mower is traveling 2 miles per hour, what is the angular speed of the wheels in revolutions per second?

(1 mile = 5280 feet; 1 foot = 12 inches)