

Name \_\_\_\_\_

MT-A141-01

Exam Two

Spring 1997

(1) 10 Points. Find the area of triangle  $ABC$  if  $a = 37.0$  meters,  $b = 38.0$  meters, and  $c = 41.0$  meters.

(2) 10 Points. Express  $\sin(5\theta) + \sin(3\theta)$  as a product.

(3) 10 Points. Find exact values, in radians, for all solutions of the equation

$$\sin(5x) = -\frac{\sqrt{2}}{2}.$$

(4) 10 Points. Use your graphing calculator to solve the equation  $\sin x = 1 - x$ . The variable  $x$  is to be measured in radians, and your approximation for  $x$  should be accurate to at least 5 decimal places.

(5) 15 Points. Solve triangle  $ABC$  if  $a = 39.50$  miles,  $b = 13.40$  miles, and  $\gamma = 25.18^\circ$ .

(6) 15 Points. Given that  $\pi/2 < \theta < \pi$  and  $\cos \theta = -5/13$ , find exact values for the following:

(a)  $\cos(\theta - \frac{\pi}{3})$

(b)  $\sin(2\theta)$

(c)  $\cos(\frac{1}{2}\theta)$

(7) 15 Points. For the function  $y = -2\sin(3x - \pi/4)$ , find the amplitude, the period, and the phase shift. Graph the equation on the graph paper below, showing at least two periods. Mark scales on the axes. You should be able to do this problem without your calculator, but you may use your calculator to check your graph.

amplitude =

period =

phase shift =

(8) 15 Points.

(a) State the reciprocal identities.

(b) State the quotient identities.

(c) State the Pythagorean identities.

(d) Use these identities to simplify the following expression:

$$\frac{\sec^2 \beta - \tan^2 \beta}{\sin \beta}$$