

This is a take-home test. You may use your notes, the book, etc. This test is due on Monday, September 10, 2007 at class time. Late tests will not be accepted! Remember to simplify all of your answers and show your work!

Change the following to radian measure:

1)  $124^\circ$

2)  $215^\circ$

Change the following to degree measure:

3)  $\frac{3\pi}{5}$  radians

4) 4.5 radians

Find the following, if they exist. Round answers to four decimal places.

5)  $\sin 423^\circ$

6)  $\csc 216^\circ$

7)  $\sec 103^\circ$

8)  $\tan 27^\circ$

9)  $\cot 309^\circ$

10) An airplane travels 150 miles in a direction of  $310^\circ$  from Atlanta. At the end of this time:

a) How far north of Atlanta is the plane?

b) How far west of Atlanta is the plane?

11) From observation tower A, a forest ranger sights a fire in the direction S  $35^\circ$  W. Observation tower B is 6.3 miles due west of tower A and due North of the fire.

a) Draw the picture that represents the situation above.

b) How far is tower A from the fire?

c) How far is tower B from the fire?

d) Which tower is closer and by how much?

12) Given a circle having a radius of 10 cm, an angle  $\theta$  intercepts an arc length of 15 cm.

a) Find the angle measure  $\theta$  in radians.

b) Find the angle measure  $\theta$  in degrees.

13) In a circle with a radius of 5.4 meters, how long is an arc associated with a central angle of  $\frac{3\pi}{10}$  radians?

Name the two angles between  $0^\circ$  and  $180^\circ$  having the following measures. Round to the nearest tenth of a degree.

14)  $\sin A = 0.423$

15)  $\sin D = 0.683$

16)  $\sin H = 0.91$

17)  $\sin B = 0.9871$

Use the Law of Sines to find the following.

18) Given  $A = 52^\circ$ ,  $B = 77^\circ$ , and  $b = 16$ , find side  $a$ .

19) Given  $A = 104^\circ$ ,  $a = 6.8$ , and  $b = 2.4$ , find angle  $B$ .

20) Given  $B = 31^\circ$ ,  $c = 7$ , and  $b = 4$ , find the possible values of angle  $C$ .

Use the Law of Cosines to find the following.

21) Given  $A = 84^\circ$ ,  $b = 13$ , and  $c = 16$ , find side  $a$ .

22) Given  $a = 7.1$ ,  $b = 5.3$ , and  $c = 4.2$ , find angle  $A$ .

23) If  $a = 3$ ,  $b = 5$ , and  $c = 7$ , find the largest angle measure.