Precalculus 4.7, 4.8, 6.1, 6.2 Test Review	Name PeriodDate
Solve the following triangles.	
1. $m \angle C = 31^{\circ}, b = 22, c = 14$	2. $a = 31, c = 20, b = 29$

3. 
$$m \angle A = 114^{\circ}, m \angle B = 34^{\circ}, a = 31$$
 4.  $m \angle B = 82^{\circ}, a = 22, b = 37$ 

5. 
$$m \angle C = 17^{\circ}, b = 23, c = 11$$
  
6.  $b = 22, c = 27, m \angle A = 105^{\circ}$ 

Find the area of each triangle to the nearest tenth.

9. 
$$\Delta$$
 FDE: d = 6 mi,  $m \angle F = 106^{\circ}$ , e = 7 mi 10.  $\Delta$ CAB: a = 7 in, b = 8.9 in, c = 14.3 in

11. 
$$\Delta EFD: d = 6 \text{ mi}, m \angle E = 107^{\circ}, f = 5 \text{ mi}$$
 12.  $\Delta HPK: p = 15 \text{ km}, k = 7 \text{ km}, h = 11.1 \text{ km}$ 

13. A poll tilts towards the sun at an  $8^{\circ}$  angle from the vertical as it casts a 22 foot shadow. The angle of elevation from the shadow to the top of the pole is  $43^{\circ}$ . How tall is the pole?



Ground

14. A boat is sailing due east parallel to the shoreline at a speed of 20 miles per hour. At a given time the bearing to a lighthouse is S  $68^{\circ}$  E, and 30 minutes later the bearing is S  $52^{\circ}$  E. Find the distance from the boat to the light house at Boat Position 2.



15. Two planes leave an airport at the same time. One plane is flying 650 mph at a bearing N  $37^{\circ}$  E, and the other plane is flying at 825 mph at a bearing of N  $53^{\circ}$  w. How far apart are the planes after flying for 2 hours?

16. The height of a radio transmission tower is 70 meters, and it casts a shadow of length 30 meters. Draw a diagram and find the angle of elevation of the sun.

17. A footbridge is to be built across a small lake from a gazebo to a dock. From a tree 100 yards from the gazebo the bearing in E  $24^{\circ}$  S. From the tree to the dock the bearing is S  $15^{\circ}$  E. The bearing from the gazebo to the dock is S  $33^{\circ}$  W. What is the length of the bridge?

18. A footbridge is to be built across a small lake from a gazebo to a dock. From a tree 100 yards from the gazebo the bearing in E  $16^{\circ}$  S. From the tree to the dock the bearing is S  $28^{\circ}$  E. The bearing from the gazebo to the dock is S  $41^{\circ}$  W. What is the length of the bridge?

19. A town planning board wishes to place sod on their village commons that is in the shape of a triangle whose sides have lengths of 120 feet, 165 feet, and 200 feet. If the sod costs \$0.35 per square foot, determine the cost, to the nearest dollar, for covering the commons in sod.

## Use your unit circle to answer the following questions.

20.	$\sin^{-1}\left(-\frac{1}{2}\right) =$	21.	$\tan \pi/4 =$
22.	$\sec(5\pi/6) =$	23.	$\cos^{-1} 1 =$
24.	$\tan^{-1}1 =$	25.	$\sin(4\pi/3) =$
26.	$\tan(3\pi/2) =$	27.	$\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) =$
28.	$\tan^{-1}\left(-\sqrt{3}\right) =$	29.	$\sin^{-1} 1 =$

## Write an algebraic expression that is equivalent to the expression.

30. $\tan\left[\arccos\left(\frac{x}{2}\right)\right]$	31. $sec[arcsin(x - 1)]$

## Find the exact value of the expression.

32. $\cos\left(\arctan\frac{3}{4}\right)$	33. $\tan\left(\arccos\frac{3}{5}\right)$
34. $\sec\left(\tan^{-1}\frac{12}{5}\right)$	35. $\operatorname{sec}\left[\sin^{-1}\left(-\frac{1}{4}\right)\right]$
36. $\cot\left(\arctan\frac{7}{10}\right)$	37. $\cot\left[\arcsin\left(-\frac{12}{13}\right)\right]$