

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Worksheet 6.5—Law of Sines**

Show all work. Calculator permitted, show all set ups.

**Multiple Choice**

- In triangle  $EFG$ , If  $F = 95^\circ$ ,  $G = 53^\circ$ , and  $e = 12$ , what is the approximate value of  $g$ ?  
(A) 8.6      (B) 15      (C) 18.1      (D) 19.2      (E) 22.6
  
- Which of the following three triangle parts do not necessarily determine the other three parts?  
(A) AAS      (B) ASA      (C) SAS      (D) SSA      (E) SSS
  
- The shortest side of a triangle with angles  $50^\circ$ ,  $60^\circ$ , and  $70^\circ$  has length of 9 furlongs. What is the approximate length, in furlongs, of the longest side?  
(A) 11      (B) 11.5      (C) 12      (D) 12.5      (E) 13

4. How many noncongruent triangles  $ABC$  can be formed if  $c = 5$ ,  $A = 60^\circ$ , and  $a = 8$ ?  
(A) none (B) one (C) two (D) three (E) infinitely many
5. How many noncongruent triangles  $ABC$  can be formed if  $A = 55^\circ$ ,  $B = 40^\circ$ , and  $C = 85^\circ$ ?  
(A) none (B) one (C) two (D) three (E) infinitely many
6. How many noncongruent triangles  $ABC$  can be formed if  $C = 36^\circ$ ,  $a = 17$ , and  $c = 16$ ?  
(A) none (B) one (C) two (D) three (E) infinitely many

7. How many noncongruent triangles  $ABC$  can be formed if  $A = 62^\circ$ ,  $B = 26^\circ$ , and  $C = 89^\circ$ ?  
(A) none (B) one (C) two (D) three (E) infinitely many

8. How many noncongruent triangles  $ABC$  can be formed if  $A = 61^\circ$ ,  $a = 8$ , and  $b = 21$ ?  
(A) none (B) one (C) two (D) three (E) infinitely many

### Short Answer

For each of the following (9 – 13), draw the triangle  $ABC$ , then use the Law of Sines to solve for all possible triangles that satisfy the given conditions. If no triangle is formed, explain why. Be sure to avoid rounding error!!!!

9.  $A = 29.5^\circ$ ,  $a = 12.9$ ,  $b = 8.7$

10.  $B = 72.6^\circ$ ,  $b = 13.7$ ,  $a = 23.2$

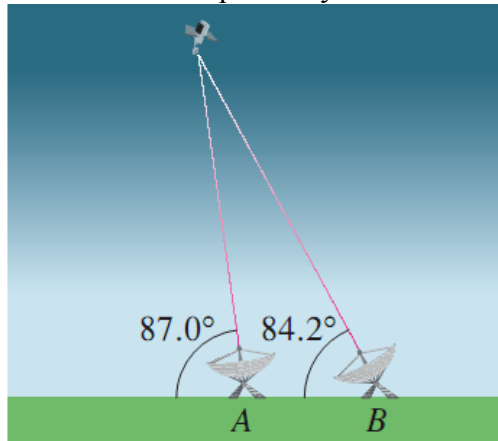
11.  $C = 57.25^\circ, b = 32.48, c = 30.72$

12.  $A = 132^\circ, b = 96, a = 105$

13.  $A = 141^\circ, a = 36, c = 66$

14.  $B = 29^\circ, b = 23, a = 31$

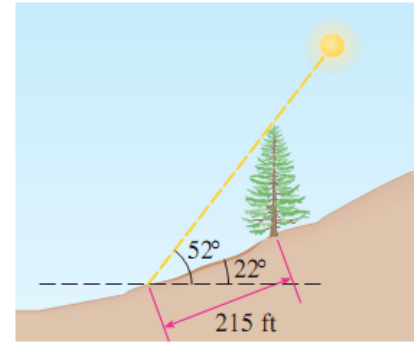
15. The path of a satellite orbiting the earth cause it to pass directly over two tracking stations A and B, which are 50 miles apart. When the satellite is on one side of the two stations, the angles of elevation at A and B are measured to be  $87.0^\circ$  and  $84.2^\circ$  respectively.



(a) How far is the satellite from station A?

(b) How high is the satellite above the ground?

16. A tree on a hillside casts a shadow 215 feet down the hill. If the angle of inclination of the hillside is  $22^\circ$  to the horizontal and the angle of elevation of the sun is  $52^\circ$ , find the height of the tree.



17. A communications tower is located at the top of a steep hill, as shown. The angle of inclination of the hill is  $58^\circ$ . A guy wire is to be attached to the top of the tower and to the ground, 100 meters downhill from the base of the tower. The angle  $\alpha$  in the figure is determined to be  $12^\circ$ . Find the length of the cable required for the guy wire.

