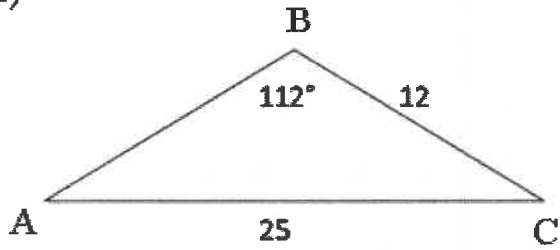Geometry
Law of Cosines and Sines
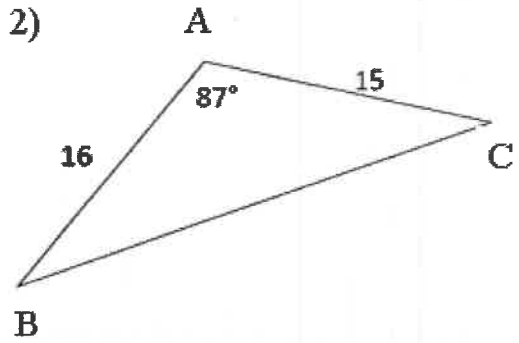
Name:_____

Solve the following triangles. Show your work
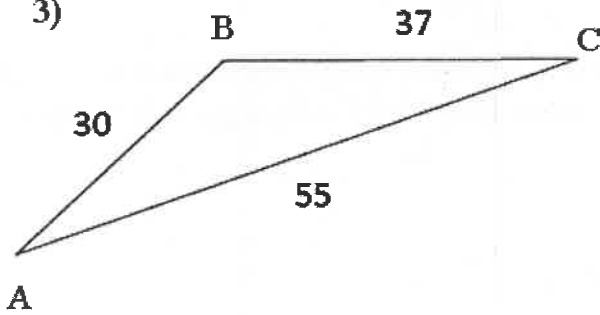
1)

B
112°   12
A   25   C

2)

A
87°   15
16   C
B

3)

B   37   C
30
55
A

4)

A   31   C
135°
22
B

5)

E
f   62
36°
D   71   F

6)

B
14   17
A   19   C
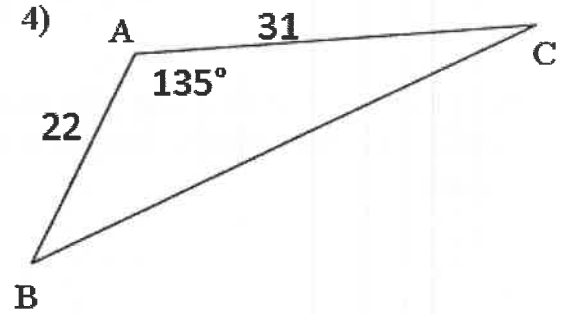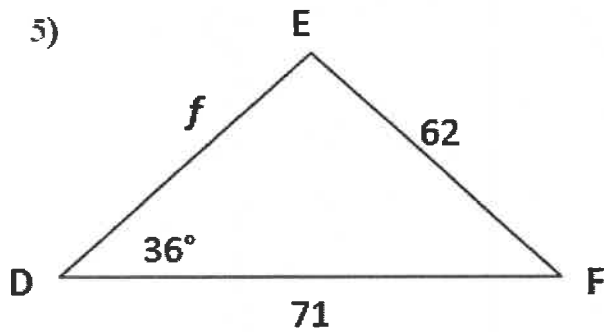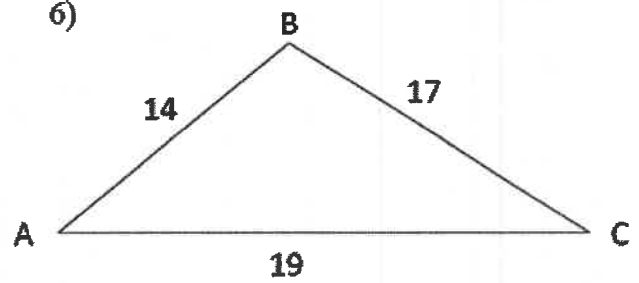
7. To find the distance between two points A and B that are on opposite sides of a river, a surveyor measures a distance on the same side of the river as point A. The distance to this point is 240 feet and call it point C. He then measures the angles from A to B as $62°$ and measures the angle from C to B as $55°$. To tenths place, approximate the distance from A to B.

8. To planes leave an airport at the same time, one flying due west at 500 km/h and the other flying due southeast at 300 km/h. What is the distance between the planes two hours later?

9. An oil tanker and a cruise ship leave port at the same time and travel straight-line courses at 10 mi/h and 25 mi/h, respectively. Two hours later they are 40 mi apart. What is the angle between their courses?

10. A vertical pole 20 m tall standing on a $15°$ slope is braced by two cables extending from the top of the pole to two points on the ground, 30 m up the slope and 30 m down the slope. How long are the cables?

11. Allya is taking a walk along a straight road. She decides to leave the road, so she walks on a path that makes a 35° with the road. After walking for 450 meters, she turns 75° and heads back to the road.

a. How far does Alliya need to walk on her current path?

b. When Alliya returns to the road, how far along the road is she from where she started?

12. A rock climber is part of the way up a climb when he can see both the peak and the base of the Gray Mountain. When viewing the peak of the mountain, his angle of elevation is 42°. When viewing the base of the mountain, his angle of depression is 36°. If he knows the Gray Mountain is 2000 feet high and the base of the mountain is at sea level, then what if the elevation of the climber to the nearest foot?

13. Two runners on an east-west highway determine the angles of elevation of a hot-air balloon are 24.5° and 22⁰. If the hot-air balloon is 1500 feet directly above a point on the highway east of both runners, how far apart are they?

14. 3 friends are camping in the woods, Bert, Ernie and Elmo. They each have their own tent and the tents are set up in a Triangle. Bert and Ernie are 10m apart. The angle formed at Bert is 30°. The angle formed at Elmo is 105°. How far apart are Ernie and Elmo?

15. During a golf match, Ian discovers that he has forgotten his sand wedge, so to avoid the bunker he plays a shot from T to F and then from F to G.

His opponent Fred decides to play directly from T to G.

How far will Fred need to hit his shot to land at G ?