

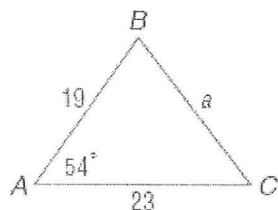
## Law of Sines and Cosines HW #2

Directions: Solve for the variable. Round to the nearest tenth if needed.

1. Find a.

$$a^2 = 23^2 + 19^2 - 2 \cdot 23 \cdot 19 \cos(54)$$

$$\boxed{a \approx 19.4}$$



2. Find the measure of  $\angle C$ .

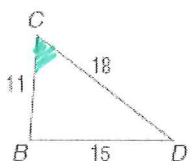
$$15^2 = 11^2 + 18^2 - 2 \cdot 11 \cdot 18 \cos C$$

$$225 = 445 - 396 \cos C$$

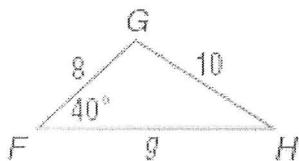
$$\cos C = \frac{-220}{-396}$$

$$\angle C = \cos^{-1}\left(\frac{220}{396}\right)$$

$$\boxed{\angle C \approx 56.3^\circ}$$



3. Solve for  $\angle H$  and g.



$$\frac{\sin H}{8} = \frac{\sin(40)}{10}$$

$$\angle H \approx \cancel{27.9^\circ} 30.9^\circ$$

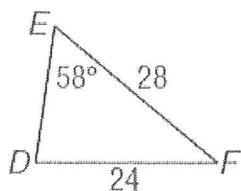
$$\boxed{\angle H \approx 30.9^\circ}$$

$$\frac{\sin(40)}{10} = \frac{\sin(109.1)}{g}$$

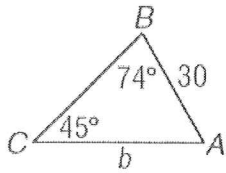
*by A sum*

$$\boxed{g \approx 14.7}$$

4. Find  $\angle D$ .



$$\boxed{\angle D = 81.6^\circ}$$

5. Find  $b$ .

$$b \approx 46.8$$

6. Solve  $\triangle DEF$  if,  $d=7$ ,  $e=8$ ,  $f=5$ 

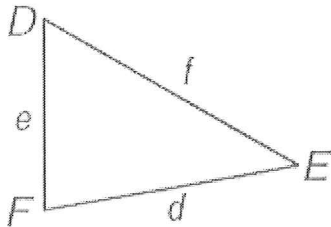
$$7^2 = 5^2 + 8^2 - 2 \cdot 5 \cdot 8 \cos D$$

$$\angle D = \cos^{-1}\left(\frac{-40}{-80}\right)$$

$$\angle D \approx 60^\circ$$

$$\angle E \approx 81.8^\circ$$

$$\angle F \approx 38.2^\circ$$



From Workbooks Study Guide pg 43 and 51.

**Directions:** Draw a triangle to go with each exercise and mark it with the given information.

**Then solve the problem. Round angle measures to the nearest degree and side measures to the nearest tenth.**

1. One side of a triangular garden is 42.0 feet. The angles on each end of this side measure  $66^\circ$  and  $82^\circ$ . Find the length of fence needed to enclose the garden.

$$192.9 \text{ ft} \quad (\text{show ALL work})$$

2. Two radar stations  $A$  and  $B$  are 32 miles apart. They locate an airplane  $X$  at the same time. The three points form  $\angle XAB$ , which measures  $46^\circ$ , and  $\angle XBA$ , which measures  $52^\circ$ . How far is the airplane from each station?

$$25.5 \text{ mi from } A$$

$$23.2 \text{ mi from } B$$

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

3. A civil engineer wants to determine the distances from points  $A$  and  $B$  to an inaccessible point  $C$  in a river.  $\angle BAC$  measures  $67^\circ$  and  $\angle ABC$  measures  $52^\circ$ . If points  $A$  and  $B$  are 82.0 feet apart, find the distance from  $C$  to each point.

86.3ft to B.  
73.9ft to A

4. A ranger tower at point  $A$  is 42 kilometers north of a ranger tower at point  $B$ . A fire at point  $C$  is observed from both towers. If  $\angle BAC$  measures  $43^\circ$  and  $\angle ABC$  measures  $68^\circ$ , which ranger tower is closer to the fire? How much closer?

Tower B is 11.0km closer to Tower A

Pg 51:

1. A triangular garden has dimensions 54 feet, 48 feet, and 62 feet. Find the angles at each corner of the garden.

$75^\circ, 48^\circ, 57^\circ$

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

2. A parallelogram has a  $68^\circ$  angle and sides 8 and 12. Find the lengths of the diagonals.

11.7  
and  
16.7

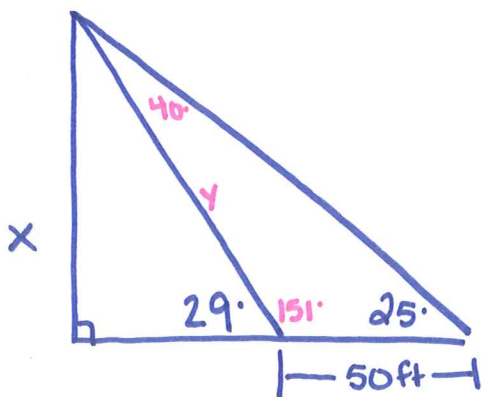
3. An airplane is sighted from two locations, and its position forms an acute triangle with them. The distance to the airplane is 20 miles from one location with an angle of elevation  $48.0^\circ$ , and 40 miles from the other location with an angle of elevation of  $21.8^\circ$ . How far apart are the two locations?

50.5 mi

4. A ranger tower at point  $A$  is directly north of a ranger tower at point  $B$ . A fire at point  $C$  is observed from both towers. The distance from the fire to tower  $A$  is 60 miles, and the distance from the fire to tower  $B$  is 50 miles. If  $m\angle ACB = 62$ , find the distance between the towers.

57.3 mi

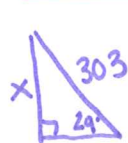
5. The angle of elevation from a point on the street to the top of a building is  $29^\circ$ . The angle of elevation from another point on the street, 50 feet farther away from the building, to the top of the building is  $25^\circ$ . To the nearest foot, how tall is the building?



Find  $y$  1st

$$\frac{\sin(25)}{y} = \frac{\sin(4)}{50}$$

$$y \approx 303 \text{ ft}$$



$$\sin(29) = \frac{x}{303}$$

$$x \approx 147$$

The building is  $\approx 147$  ft tall