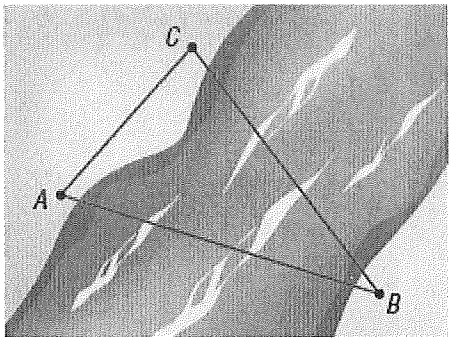
Name: _____ Hour: _____

Law of Sines and Cosines Combo HW

Directions: Round to the nearest tenth if needed.

1. Mrs. Doud is planting a vegetable garden in the shape of a triangle. The side lengths are as follows: 20 feet, 30 feet, 45 feet. Mrs. Doud wants to find the measure of the largest angle to make sure it will fit in the back yard.

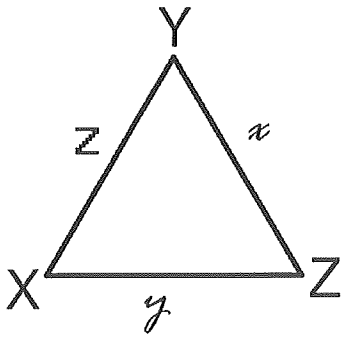
2. **SURVEYING** To find the distance between two points A and B that are on opposite sides of a river, a surveyor measures the distance to point C on the same side of the river as point A. The distance from A to C is 240 feet. He then measures the angle across from A to B as 62° and measures the angle across from C to B as 55°. Find the distance from A to B.



Name: _____ Hour: _____

Solve the ΔXYZ

3. x=16, <X=48°, and <Y=82°.

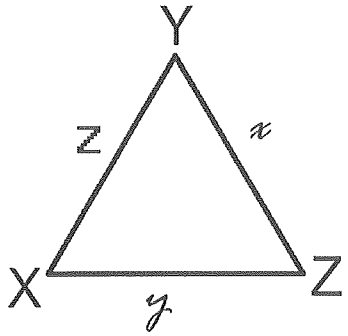


y = _____

<Z=_____

z =_____

4. x=8, y=10, and <Z=61°.

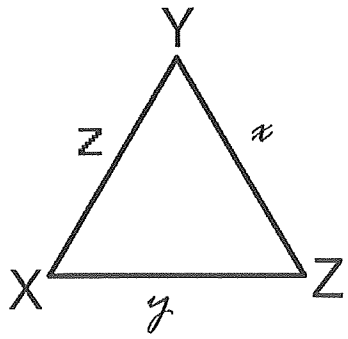


z = _____

<X=_____

<Y=_____

5. x=18, y=23, and z=37



<X= _____

<Y=_____

<Z =_____

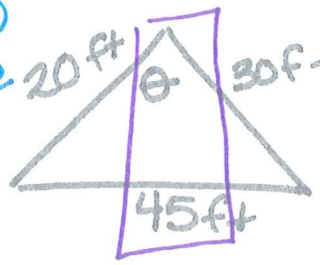
Name: Key Hour: _____

Law of Sines and Cosines Combo HW

Directions: Round to the nearest tenth if needed.

1. Mrs. Doud is planting a vegetable garden in the shape of a triangle. The side lengths are as follows: 20 feet, 30 feet, 45 feet. Mrs. Doud wants to find the measure of the largest angle to make sure it will fit in the back yard.

Law of cosines



$45^2 = 20^2 + 30^2 - 2 \cdot 20 \cdot 30 \cos\theta$

$2025 = 1300 - 1200\cos\theta$

$-1300 \quad -1300$

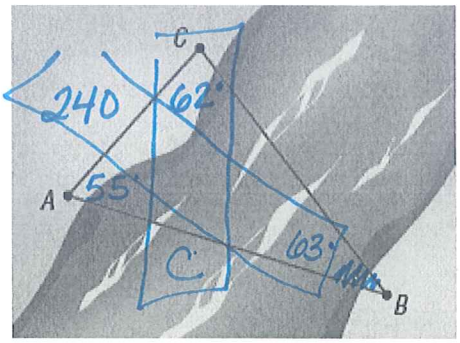
$\frac{725}{-1200} = \frac{-1200\cos\theta}{-1200}$

$\cos\theta = \frac{725}{-1200}$

$\theta = \cos^{-1}\left(\frac{725}{-1200}\right)$

$\theta \approx 127.2^\circ$

2. **SURVEYING** To find the distance between two points A and B that are on opposite sides of a river, a surveyor measures the distance to point C on the same side of the river as point A. The distance from A to C is 240 feet. He then measures the angle across from A to B as 62° and measures the angle across from C to B as 55°. Find the distance from A to B.



Law of Sines!

$\frac{\sin(62)}{c} = \frac{\sin(63)}{240}$

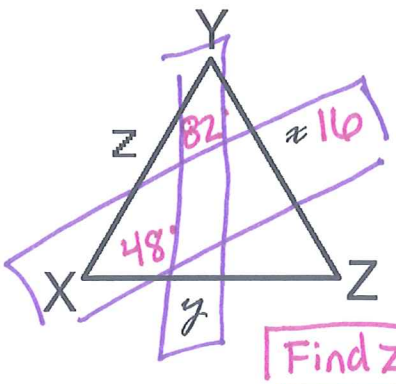
$\frac{240 \cdot \sin(62)}{\sin(63)} = \frac{c \cdot \sin(63)}{\sin(63)}$

$c = 237.8\text{ ft}$

Name: _____ Hour: _____

Solve the ΔXYZ

3. x=16, <X=48°, and <Y=82°.



Find y:

$\frac{\sin(82)}{y} = \frac{\sin(48)}{16}$

$\frac{16 \cdot \sin(82)}{\sin(48)} = \frac{y \cdot \sin(48)}{\sin(48)}$

$y = 21.3$

y = 21.3

Δsum

<Z= 50°

Find Z

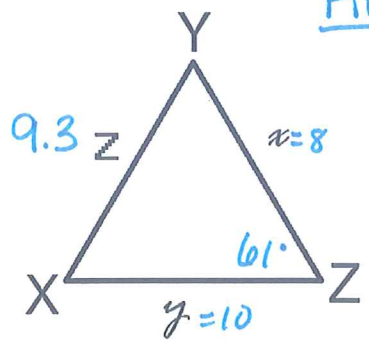
$\frac{\sin(50)}{z} = \frac{\sin(48)}{16}$

$16 \cdot \sin(50) = z \sin(48)$

$z = 16.5$

z = 16.5

4. x=8, y=10, and <Z=61°.



Find z: $z^2 = 10^2 + 8^2 - 2 \cdot 10 \cdot 8 \cos(61°)$

$z = 9.3$

z = 9.3

Find <X

$\frac{\sin x}{8} = \frac{\sin(61)}{9.3}$

$x = \sin^{-1}\left(\frac{8 \cdot \sin(61)}{9.3}\right)$

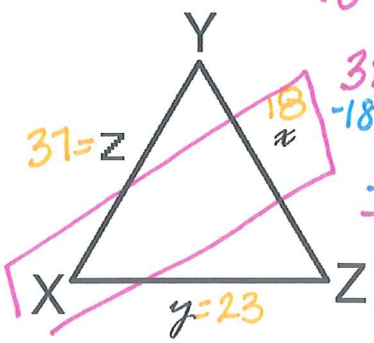
$X \approx 48.8°$

<X= 48.8°

Δsum

<Y= 70.2°

5. x=18, y=23, and z=37



$18^2 = 37^2 + 23^2 - 2 \cdot 37 \cdot 23 \cos X$

$324 = 1898 - 1702 \cos X$

$-1898 \quad -1898$

$\frac{-1574}{-1702} = \frac{-1702 \cos X}{-1702}$

$\cos X = \frac{-1574}{-1702}$

$x = \cos^{-1}\left(\frac{-1574}{-1702}\right)$

$X \approx 22.4°$

<X= 22.4°

<Y= 29.1°

Δsum

<Z = 128.5°

$\frac{\sin Y}{23} = \frac{\sin(22.4)}{18}$

$\angle Y = \sin^{-1}\left(\frac{23 \cdot \sin(22.4)}{18}\right)$

$\angle Y = 29.1°$