Name: Key Date: 3/5/18

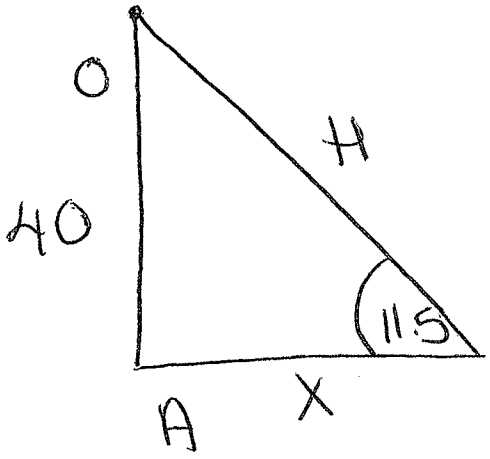
TRIGONOMETRY REVIEW
Quiz TOMORROW, March 6th

Topics on quiz:
- *Angle of Elevation/Angle of Depression*
- *Pythagorean Theorem and Trigonometry*
- *Law of Sines*
- *Cofunctions*

TOPIC #1: ANGLE OF ELEVATION/DEPRESSION

1. Samuel is at the top of a tower and will ride a trolley down a zip-line to a lower tower. The total vertical distance drop of the zip-line to the lower tower is 40 feet. The zip line's angle of elevation from the lower tower is 11.5°. What is the horizontal distance between the towers, to the nearest foot?

$SOH\ CAH\ TOA$



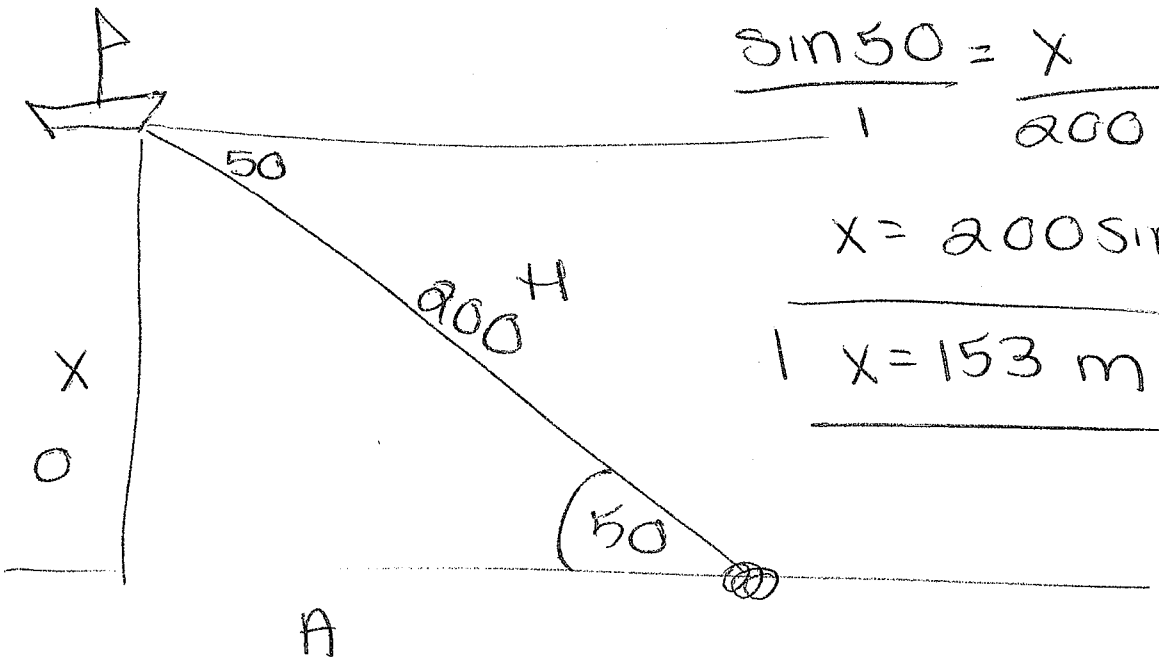
$$\frac{\tan 11.5}{1} = \frac{40}{x}$$

$$\frac{x \tan 11.5}{\tan 11.5} = \frac{40}{\tan 11.5}$$

$x = 197$ feet

$S\frac{O}{H}\ C\frac{A}{H}\ T\frac{O}{A}$

2. A ship on the ocean surface detects a sunken ship on the ocean floor at an angle of depression of 50°. The distance between the ship on the surface and the sunken ship on the ocean floor is 200 meters. If the ocean floor is level in this area, how far above the ocean floor, to the *nearest meter*, is the ship on the surface?



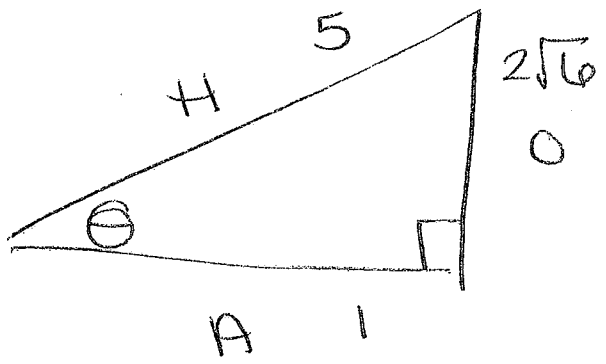
$\frac{\sin 50}{1} = \frac{x}{200}$

$x = 200 \sin 50$

$x = 153 \text{ m}$

TOPIC #2: TRIGONOMETRY AND THE PYTHAGOREAN THEOREM

3. Given an acute angle of measure θ, $cos\theta = \frac{1}{5}$. Find $sin\theta$ and $tan\theta$.



$\cos\theta = \frac{1}{5} = \frac{A}{H}$

$1^2 + x^2 = 5^2$

$1 + x^2 = 25$

$-1 \quad -1$

$\sqrt{x^2} = \sqrt{24}$

$x = \sqrt{24}$

$\sqrt{4}\sqrt{6}$

$x = 2\sqrt{6}$

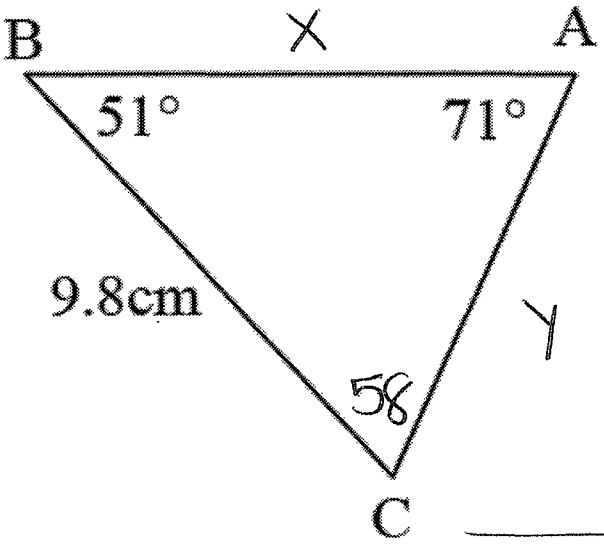
$\sin\theta = \frac{2\sqrt{6}}{5}$

$\tan\theta = \frac{2\sqrt{6}}{1}$

TOPIC #3: LAW OF SINES

nearest tenth

4. Find the measure of the missing angle and the measures of the missing sides.



$$\frac{9.8}{\sin 71} = \frac{x}{\sin 58}$$

$$\frac{x \sin 71}{\sin 71} = \frac{9.8 \sin 58}{\sin 71}$$

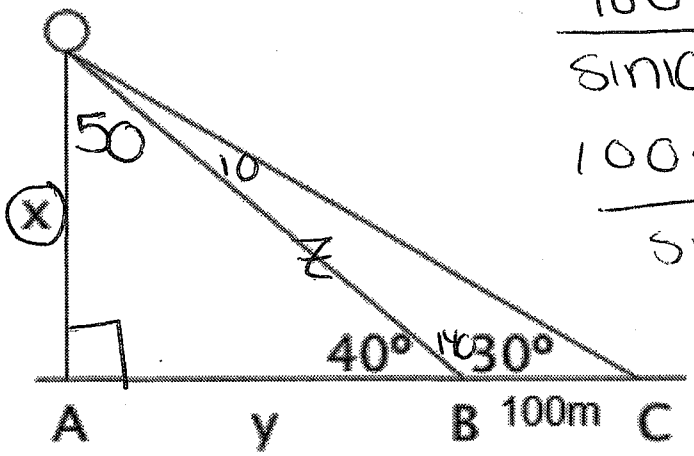
$$\boxed{x = 8.8}$$

$$\frac{9.8}{\sin 71} = \frac{y}{\sin 51}$$

$$\frac{y \sin 71}{\sin 71} = \frac{9.8 \sin 51}{\sin 71}$$

$$\boxed{y = 8.1}$$

5. An observation balloon is attached to the ground at point A. On a level with A and in the same straight line, the points B and C were chosen so that BC equals 100 meters. From points B and C, the angle of elevation of the balloon is 40° and 30° respectivley. Find the height of the balloon. nearest meter



$$\frac{100}{\sin 10} = \frac{z}{\sin 30}$$

$$\frac{100 \sin 30}{\sin 10} = \frac{z \sin 10}{\sin 10}$$

$$\boxed{z = 288}$$

$z = 287.9385$

$$\frac{x}{\sin 40} = \frac{287.9385}{\sin 90}$$

$$\frac{x \sin 90}{\sin 90} = \frac{287.9385 \sin 40}{\sin 90}$$

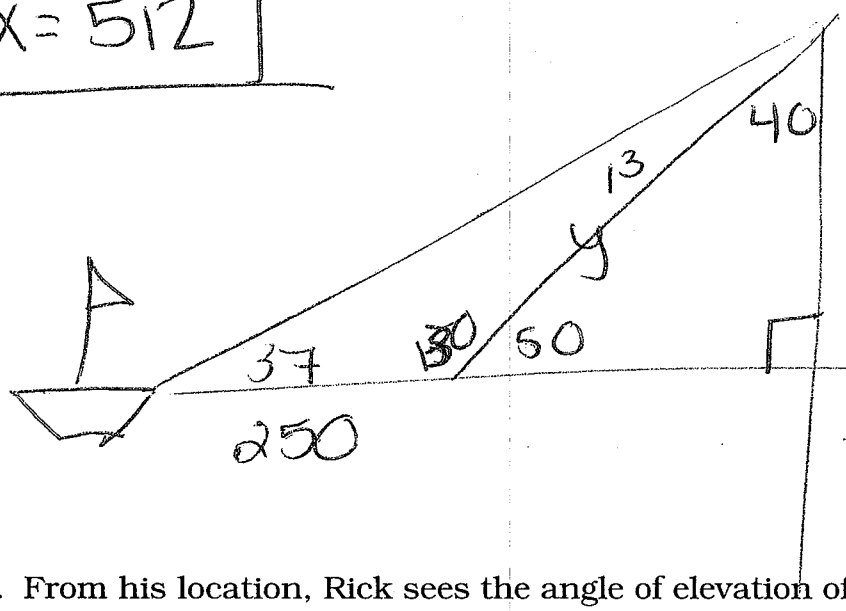
$$\boxed{x = 185}$$

6. A ship captain at sea uses a sextant to sight an angle of elevation of 37 degrees to the top of the lighthouse. After the ship travels 250 feet directly toward the lighthouse, another sighting is made, and the new angle of elevation is 50 degrees. Find, to the nearest foot, the height of the lighthouse.

$X = 512$

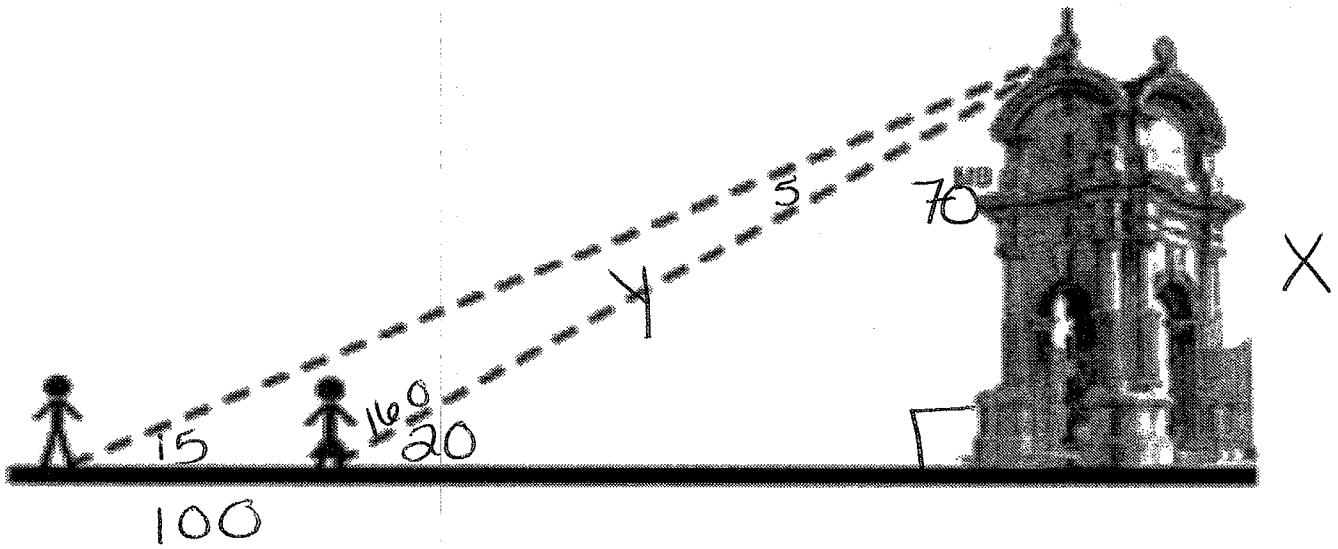
$\frac{250}{\sin 13} = \frac{y}{\sin 37}$

$y = 668.8289$



$\frac{X}{\sin 50} = \frac{668.8289}{\sin 90}$

7. From his location, Rick sees the angle of elevation of the top of a monument to be 15°. Kate sees the angle of elevation of the top to be 20°. If Rick and Kate are 100 feet apart, how tall I the monument, to the *nearest foot*?



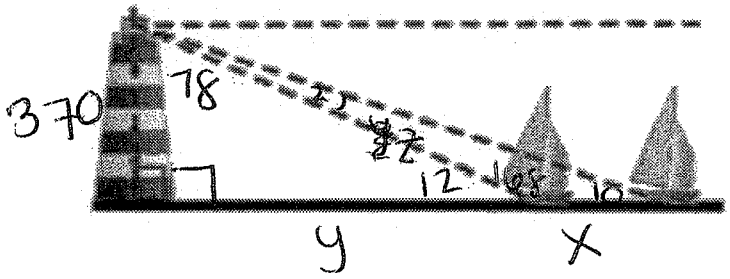
$\frac{100}{\sin 5} = \frac{y}{\sin 15}$

$y = 296.9616$

$\frac{X}{\sin 20} = \frac{296.9616}{\sin 90}$

$X = 102$

8. An observer from the top of a lighthouse 370 feet above sea level sees two sailboats in the water. The angles of depression to the boards are 12° and 10°, respectively. How far apart are the boats, to the *nearest foot*?



$\frac{x}{\sin 2} = \frac{z}{\sin 90}$

$\frac{y}{\sin 78} = \frac{370}{\sin 12}$

$y = 1740.7131$

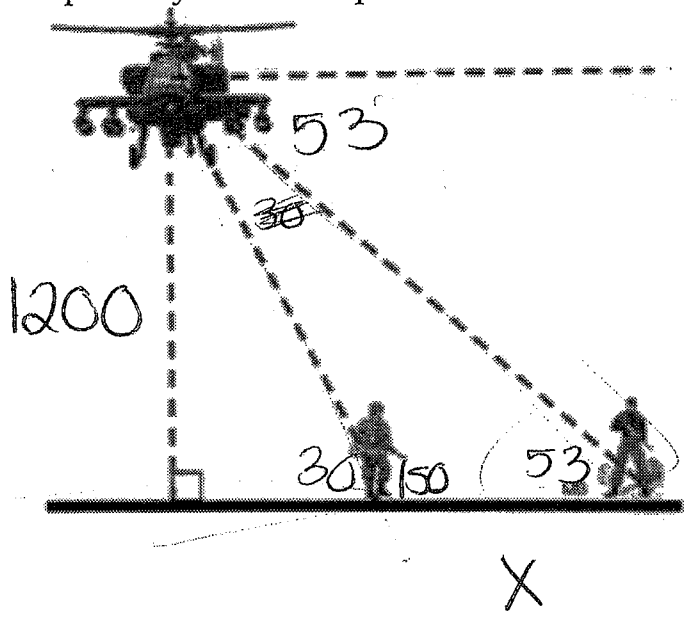
$\frac{x}{\sin 2} = \frac{1779.6017}{\sin 10}$

$\frac{z}{\sin 90} = \frac{370}{\sin 12}$

$z = 1779.6017$

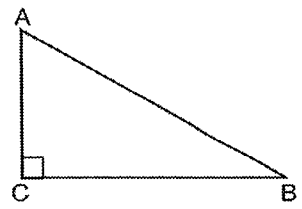
$x = 358$

9. A pilot in an Apache rescue helicopter, at an altitude of 1200 feet, spots his two soldiers on the ground. The angles of depression to the soldiers are 53° and 30°, respectively. How far apart are the two soldiers, to the *nearest foot*?



TOPIC #4: COFUNCTIONS

10. In scalene triangle ABC shown in the diagram below, $m\angle C = 90°$.



Which equation is always true?

1) $\sin A = \sin B$
2) $\cos A = \cos B$
3) $\cos A = \sin C$
4) $\sin A = \cos B$

16. In right triangle ABC, $m\angle C = 90°$. If $\cos B = \frac{5}{13}$, which function also equals $\frac{5}{13}$?

1) $\tan A$
2) $\tan B$
3) $\sin A$
4) $\sin B$

17. In right triangle ABC, m<C = 90°:

a) If $cosA = \frac{1}{5}$. what is $sinB$?

1/5

b) If $sinA = \frac{8}{10}$, what is $cosB$?

8/10

18. The following equations contain the measure of two acute angles. Find a value of x for which the statement is true:

$sin60 = cosx$ $\quad x =$ 40

$cos44 = sinx$ $\quad x =$ 46

19. If $\sin 6A = \cos 9A$, then $m\angle A$ is equal to

1) 6
2) 36
3) 45
4) $1\frac{1}{2}$

15A = 90

A = 6

20. If $\sin 2A = \cos 3A$, then $m\angle A$ is

1) $1\frac{1}{2}$
2) 5
3) 18
4) 36

5A = 180

21. If $\sin(A-30)^\circ = \cos 60^\circ$, the number of degrees in the measure of angle A is

1) 30
2) 60
3) 90
4) 120

$A-30+60=90$
$A+30=90$
$A=60$

22. Which is a value of x if $\sin 60^\circ = \cos(x+10)^\circ$?

1) 10°
2) 20°
3) 50°
4) 60°

$60+x+10=90$
$x+70=90$
$x=20$

23. If $\cos(x+30^\circ) = \sin x$, a measure of angle x is

1) 15°
2) 30°
3) 45°
4) 60°

$x+30+x=90$
$2x=60$
$x=30$

24. If $\sin(x+20^\circ) = \cos x$, the value of x is

1) 35°
2) 45°
3) 55°
4) 70°

$2x+20=90$
$2x=70$