

Key

Right Triangle Things to Know!

- Solve a right triangle, SOH CAH TOA, $\sin \theta = \frac{opp}{hyp}$, $\cos \theta = \frac{adj}{hyp}$, $\tan \theta = \frac{opp}{adj}$,
 $\csc \theta = \frac{hyp}{opp}$, $\sec \theta = \frac{hyp}{adj}$, $\cot \theta = \frac{adj}{opp}$
- Use SOH CAH TOA and Pyth Thm to solve RIGHT triangles only.

Law of Sines Things to Know!

- Law of Sines - $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$.
- Use if you have ASA or AAS (that is not a right triangle), then you will only produce 1 triangle
- Use if you have SSA (that is not a right triangle), then you could produce 0, 1 or 2 triangles. If $\sin A > 1$, then no solution. If $\sin A < 1$, consider 2 triangles!!!!

Law of Cosines Things to Know!

- Law of Cosines - $a^2 = b^2 + c^2 - 2bc \cos A$, $b^2 = a^2 + c^2 - 2acc \cos B$, $c^2 = a^2 + b^2 - 2ab \cos C$
- Use Law of Cosines if you have SAS or SSS. Always solve for the biggest angle first if solving the triangle.

Area of a Triangle

- The area of a triangle with sides of lengths a and b and with included angle θ is $A = \frac{1}{2} ab \sin \theta$.

Mixing it up!

1. A guy wire from the top of the transmission tower at WJBC forms a 75° angle with the ground at a 55-foot distance from the base of the tower. How tall is the tower? 203.3 ft

2. In order to determine the distance between two points A and B on opposite sides of a lake, a surveyor chooses a point C that is 900 ft from A and 225 ft from B. If the measure of the angle at C is 70° , find the distance between A and B. 849.8 ft

3. Two markers A and B are on the same side of a canyon rim 56 ft apart. A third marker, C, located across the rim, is positioned so that $\angle BAC = 72^\circ$ and $\angle ABC = 53^\circ$. Find the distance between C and A. 54.6 ft

4. A civil engineer wants to determine the distances from points A and B to an inaccessible point C, as shown. From direct measurements, the engineer knows that $AB = 25m$, $\angle A = 110^\circ$, and $\angle B = 20^\circ$. Find AC and BC. 11.2 30.67

5. The base of a ladder is 6ft from the building, and the angle formed by the ladder and the ground is 73° . How high up the building does the ladder touch? 19.6 ft

6. A car travels along a straight road, heading east for 1 hour, then changing to northeast direction at 135° onto another road, traveling for 30 min. If the car has maintained a constant speed of 40mph, how far is it from its starting point? 55.96 miles

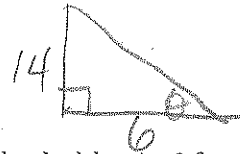
7. Suppose you want to fence a triangular lot. If two sides measure 84 feet and 78 feet and the angle between the two sides is 102° , what is the length of the fence to the nearest foot? What is the area of the triangular lot? Perimeter = 288 ft (missing side = 126) Area = 3204.4 ft²

8. Two surveyors 560 yards apart sight a boundary marker C on the other side of a canyon at angles of 27° and 38° . Their measurements will be used to plan a bridge that spans the canyon. How long will the bridge be, to the nearest tenth. 172.7 yds

9. Find the area of an equilateral triangle with side length of 10. 43.3

10. In $\triangle ABC$, $AB = 12$ meters and $AC = 20$ meters. If the area of the triangle is 77 sq. meters, find the measure of $\angle A$, to the nearest degree. 39.9 40°

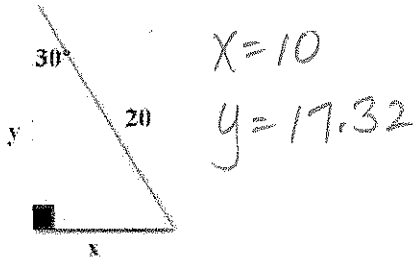
AFM Triangle Trig Review



Key

- A ladder leans against a building. The foot of the ladder is 6 feet from the building. The ladder reaches a height of 14 feet on the building.
 - Find the length of the ladder 15.23 ft
 - To the nearest degree, what angle does the ladder make with the ground? $\tan \theta = \frac{14}{6}$
 $\theta = 66.8^\circ$

- Find x and y



- From the top of a barn 25 feet tall, you see a cat on the ground. The angle of depression of the cat is 40° . How many feet, to the nearest foot, must the cat walk to reach the barn?

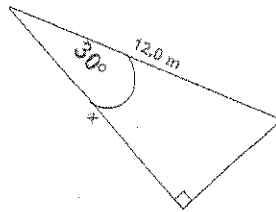


- A triangle has an acute angle such that $\sin \theta = \frac{3}{7}$. Find the other five trigonometric ratios.

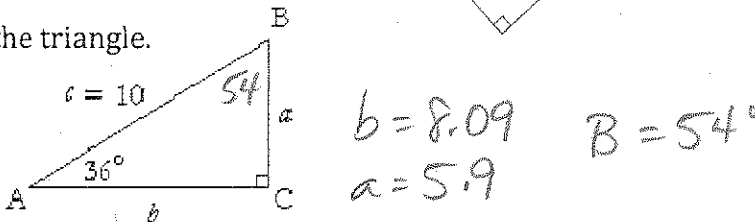
$\cos \theta = \frac{2\sqrt{10}}{7}$ $\sec \theta = \frac{7\sqrt{10}}{20}$
 $\tan \theta = \frac{3\sqrt{10}}{20}$ $\cot \theta = \frac{2\sqrt{10}}{3}$
 $\csc \theta = \frac{7}{3}$

- Find the side labeled x

$x = 10.4$



- Solve the triangle.



- A 30 foot flagpole casts a shadow of 135 feet long. What is the angle of elevation?

12.53°

- The angle of depression from the top of a 180-m cliff to a log cabin is 42° . How far is the cabin from the foot of the cliff?

199.9 ft

- John wants to measure the height of a tree. He walks exactly 100 feet from the base of the tree and looks up. The angle from the ground to the top of the tree is 33° . This particular tree grows at an angle of 83° with respect to the ground rather than vertically (90°). How tall is the tree?

60.6 ft

- A building is of unknown height. At a distance of 100 feet away from the building, an observer notices that the angle of elevation to the top of the building is 41° and that the angle of elevation to a poster on the side of the building is 21° . How far is the poster from the roof of the building?

48.54 ft

- Triangle ABC has $\angle A = 32^\circ$, $\angle B = 81.8^\circ$, and side $a = 42.9$ inches. What is the measure of side c?

74.07