

Use SOH CAH TOA to memorize the three main trigonometric functions.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 5, Lesson 1

1. Warm-up
2. Notes
3. ICA
4. Extra Practice:

Language Objectives

I will listen and take notes as the teacher guides me through finding missing sides and angles using right triangle trigonometry.

I will explain the steps required to find missing sides and angles using right triangle trigonometry.

I will write a summary for finding missing sides and angles using right triangle trigonometry.

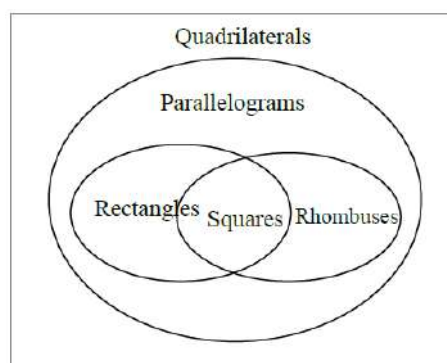
Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: A six foot man casts an eight foot shadow, find the height of the tree if it has a 32 foot shadow.



35. Use the Venn diagram to decide which of the following statements is true.

- A. All rectangles are squares.
- B. All squares are rectangles.
- C. All rhombi are squares.
- D. All parallelograms are rhombuses.



35 G-CO.11
35 Geo1.5
35 HS.3.1.PO 1

14 %

A

40 % *

B

15 %

C

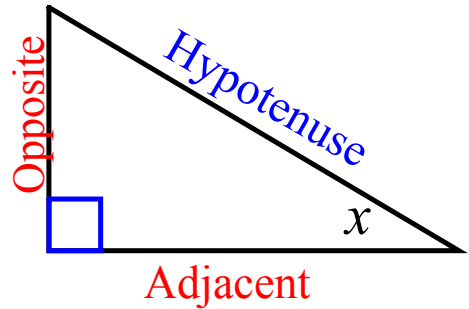
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D

Right Triangle Trigonometry

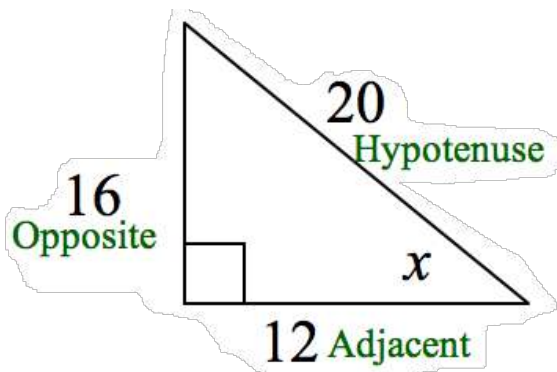
Algorithm:

1. Choose an angle. (x)
2. Identify the sides.
(Opposite, adjacent and hypotenuse)
3. Use the trigonometric ratios to find the missing sides or angles.
(SOH CAH TOA)

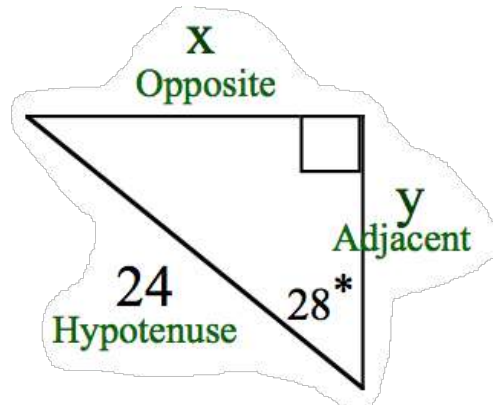


$$\sin x = \frac{\text{Opposite}}{\text{Hypotenuse}}, \quad \cos x = \frac{\text{Adjacent}}{\text{Hypotenuse}}, \quad \tan x = \frac{\text{Opposite}}{\text{Adjacent}}$$

Examples:



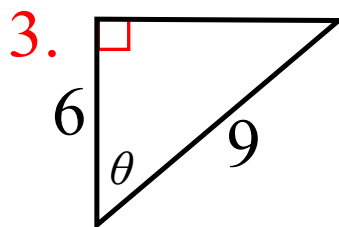
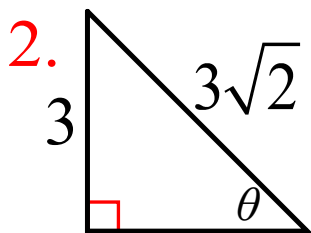
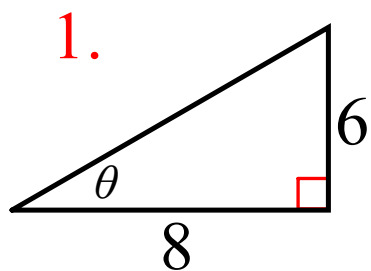
$$\begin{aligned} \sin x &= \frac{16}{20} \\ \sin x &= 0.8 \\ x &= \end{aligned}$$



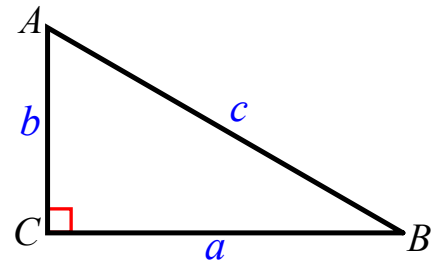
$$\begin{aligned} 28 &= \frac{x}{24} & \cos 28 &= \frac{x}{24} \\ 24 \cdot 28 &= x & 24 \cos 28 &= \\ 24(.4695) &= x & 24(.8829) &= \\ &= x & 21.19 &= \end{aligned}$$

Summary:

Evaluate the trigonometric functions of the angle θ



Solve $\triangle ABC$ using the diagram and the given measurements.



1. $B = 24^\circ$, $a = 8$

2. $A = 19^\circ$, $b = 4$

3. $A = 29^\circ$, $b = 21$

4. $B = 65^\circ$, $c = 12$

5. $A = 37^\circ$, $c = 22$

6. $B = 41^\circ$, $c = 18$

7. $A = 70^\circ$, $c = 30$

8. $B = 56^\circ$, $a = 6.8$

Understand that the term “solving the triangle” means that if we start with a right triangle and know any two sides, we can find or solve for the unknown side.

Investigate the fundamental concepts behind trigonometry: three basic trig functions and how to determine which trig function to use.

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Week 5, Lesson 2

1. Warm-up
2. Investigation
3. ICA
4. Extra Practice

Language Objectives

I will discuss angle of elevation and angle of depression with the members of my group.

I will demonstrate how to find the angle of depression using a hand made inclinometer.

I will write a summary explaining the angle of depression and the angle of elevation.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.



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.

a. Find the length of the ladder to the *nearest foot*.

Choose:

- 14 15 15.2 16

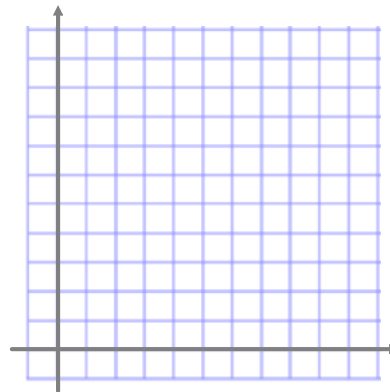
b. Find to the *nearest degree*, the angle the ladder makes with the ground.

Choose:

- 23 24 66 67

41. A right triangle ABC is drawn on a coordinate plane has coordinates of $A(2,10)$ $B(2,2)$, and $C(8,2)$. What is the length of the hypotenuse?

- A. 6
B. 8
C. 10
D. 12



36 G-CO.11
36 Geo1.5
36 HS.4.1.PO 7

29 %

A

18 %

B

11 %

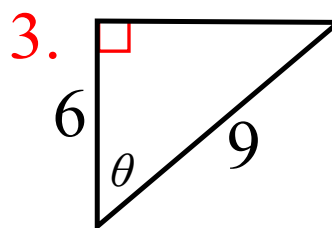
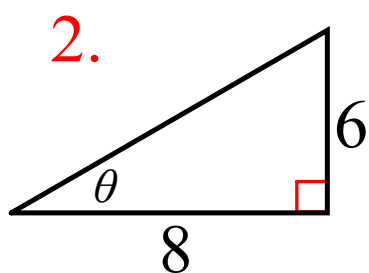
C

37 % *

D

A piece of lumber leans against a wall. The top of this 40 foot piece of lumber touches a point on the wall that is 36 feet above the ground. Find to the *nearest degree* the measure of the angle that the lumber makes with the wall.

Evaluate the trigonometric functions of the angle θ



Know that recognizing special right triangles (30, 60 and 90) in geometry can help you to problem solve.
Use SOHCAHTOA to memorize the three main trigonometric functions.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 5, Lesson 3

1. Warm-up
2. Notes
3. ICA
4. Extra Practice

Language Objectives

I will listen and take notes as the teacher guides me through solving 30-60-90 triangles.

I will explain the steps required to solve 30-60-90 triangles.

I will write a summary for solving 30-60-90 triangles.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.



A ladder 6 feet long leans against a wall and makes an angle of 71° with the ground. Find to the *nearest tenth* of a foot how high up the wall the ladder will reach.

36. Which quadrilateral has all of the following properties?

- A. Trapezoid
- B. Quadrilateral
- C. Rectangle
- D. Isosceles trapezoid

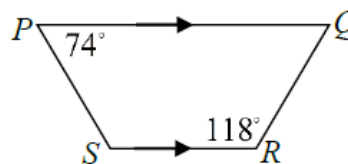
- i. One pair of parallel sides
- ii. Base angles are congruent
- iii. It is not a parallelogram

36 G-CO.11
36 Geo1.5
36 HS.4.1.PO 7

29 %	18 %	11 %	37 % *
A	B	C	D

40. $PQRS$ is a trapezoid. What is the measure of $\angle S$?

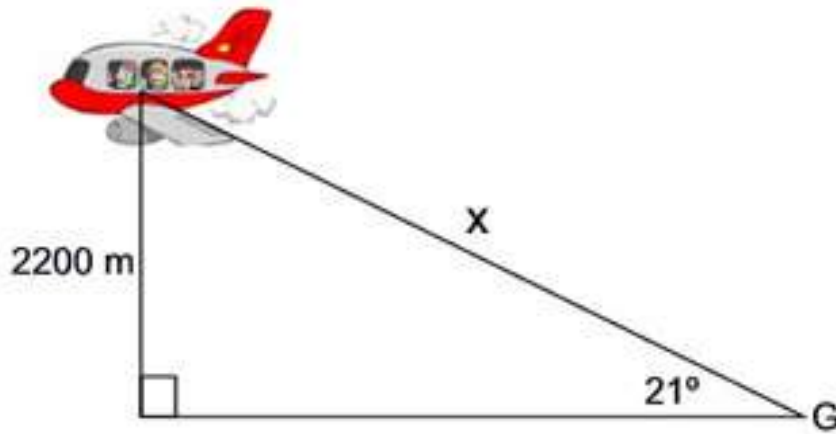
- A. $m\angle S = 62^\circ$
- B. $m\angle S = 74^\circ$
- C. $m\angle S = 106^\circ$
- D. $m\angle S = 118^\circ$



40 G-CO.11
40 Geo1.5
40 HS.4.1.PO 6

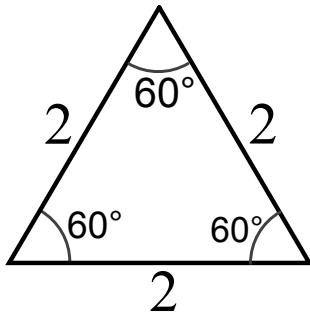
9 %	9 %	37 % *	41 %
A	B	C	D

Find the missing side.

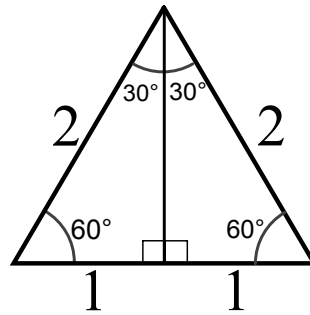


30 - 60 - 90 Triangle

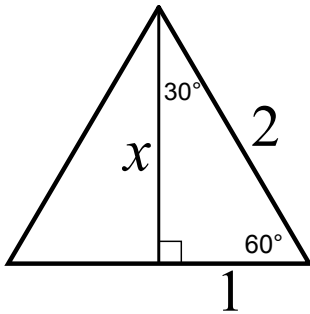
Start with an equilateral triangle
(all sides equal, all angles 60°)



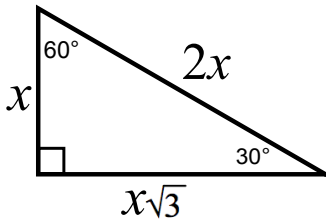
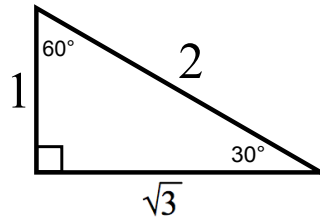
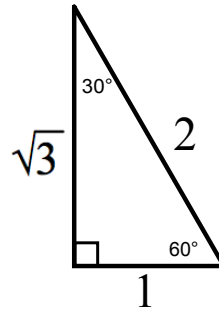
Use a perpendicular bisector
to create 2 right triangles



30 - 60 - 90 Triangle

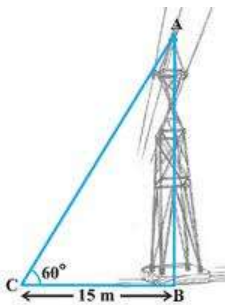


$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 (1)^2 + (x)^2 &= (2)^2 \\
 1 + x^2 &= 4 \\
 x^2 &= 3 \\
 x &= \sqrt{3}
 \end{aligned}$$

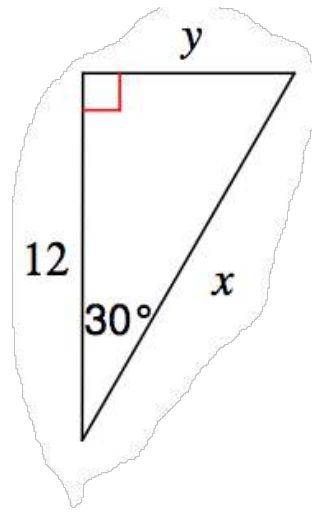
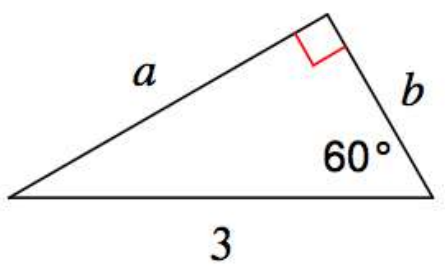
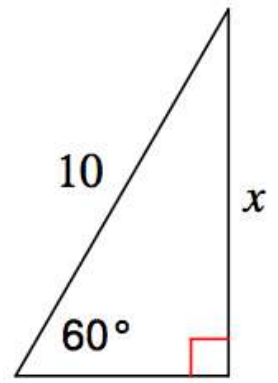
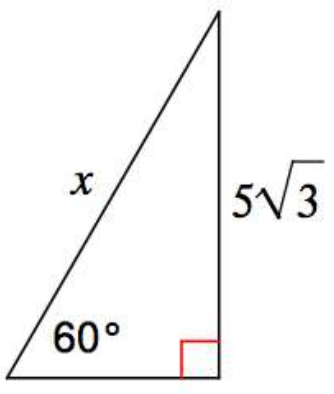
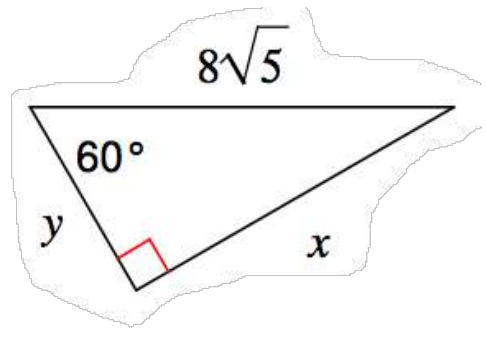
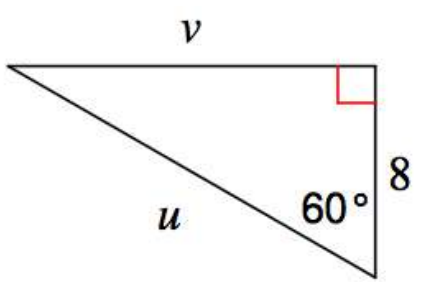
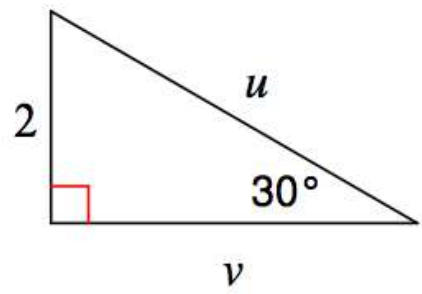
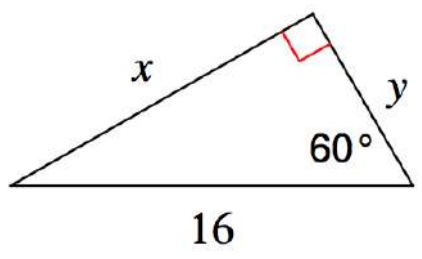


	30°	60°
sin θ	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$
cos θ	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$
tan θ	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$

Why memorize 30-60-90 triangle?



Summary:



Understand that the term “solving the triangle” means that if we start with a right triangle and know any two sides, we can find or solve for the unknown side.

Investigate the fundamental concepts behind trigonometry: three basic trig functions and how to determine which trig function to use.

Know that recognizing special right triangles (30, 60 and 90) in geometry can help you to problem solve.

Use SOHCAHTOA to memorize the three main trigonometric functions.

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Week 5, Lesson 4

1. Warm-up
2. ICA
3. Extra Practice

Language Objectives

I will work with the members of my group to solve triangles using right triangle trigonometry.

I will explain the steps required to solve a triangle using trigonometry.

I will write a summary for using right triangle trigonometry to solve right triangles.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.

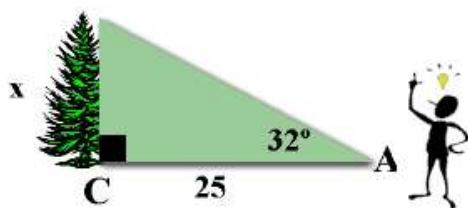


From a point on the ground 25 feet from the foot of a tree, the angle of elevation of the top of the tree is 32° . Find to the *nearest foot*, the height of the tree.



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?

Pull



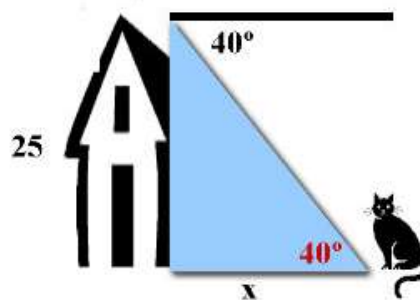
Draw a diagram showing the information.

$$\tan 32 = \frac{x}{25}$$

$$.6249 = \frac{x}{25}$$

$$x = 15.6225 = 16 \text{ feet}$$

Pull



Remember that the angle of depression (40°) is outside of the triangle and that the angle of elevation (40°) equals the angle of depression.

Using the angle of elevation:

$$\tan 40 = \frac{25}{x}$$

$$.8391 = \frac{25}{x}$$

$$x = 30 \text{ rounded}$$

