(A) Lesson Context

BIG PICTURE of this UNIT:	• How do I determine the measure of angles in geometric shapes, without direct measurement? • How do I solve for sides or angles in right triangles? • How do I model real world scenarios using right triangles?		
CONTEXT of this LESSON:	Where we've been You know how to use triangle trig to find the measure of a side given an angle measure and a side length.	Where we are How we use right triangle trig to find the measure of an angle	Where we are heading How can I solve problems that involving geometric models with right triangles?

(B) Lesson Objectives:

a. Introduce the role of an inverse in mathematics
b. Determine the measure of an angle using the trig ratios

(C) Inverses in Mathematics

a. Explain how to solve the equation x + 5 = 8

b. Explain how to solve the equation x – 5 = 8

c. Explain how to solve the equation 5x = 8

d. Explain how to solve the equation $\frac{x}{5} = 8$

e. Explain how to solve the equation $x^2 = 8$

f. Explain how to solve the equation $\sqrt{x} = 8$

g. One thing has been constant in ALL these examples ➔ ….

h. What does the equation sin(x) = 0.58 mean in the first place?

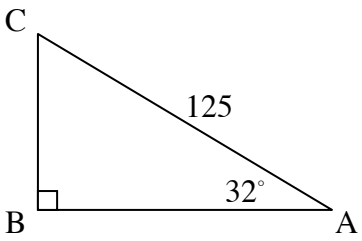
i. So how would we solve the equation sin(x) = 0.58 …..?

Name: _____ Date: _____

Solving For Missing Angles
Algebra 1

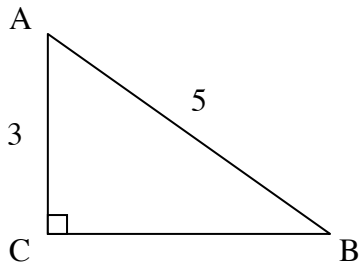
Today we will learn how to use right triangle trigonometry to find missing angles of a right triangle. In the first exercise, though, we will review how to solve for a missing side using trigonometry.

Exercise #1: Find the length of $\overline{AB}$ to the nearest *tenth*.



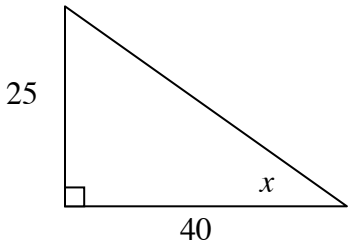
Solving for a Missing Angle – The process for finding a missing angle in a right triangle is very similar to that of finding a missing side. The key is to identify a trigonometric ratio that can be set up and then use the inverse trigonometric functions to solve for that angle.

Exercise #2: Solve for $m\angle B$ to the *nearest degree*.



Exercise #3: Find the value of x, in the diagrams below, to the *nearest degree*.

(a)



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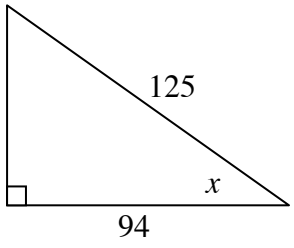
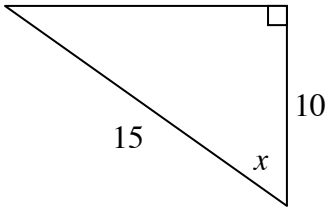


Exercise #4: Find the value of x in the diagrams below. Round your answers to the nearest degree.

(a)



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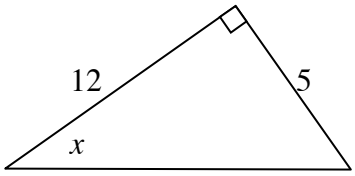
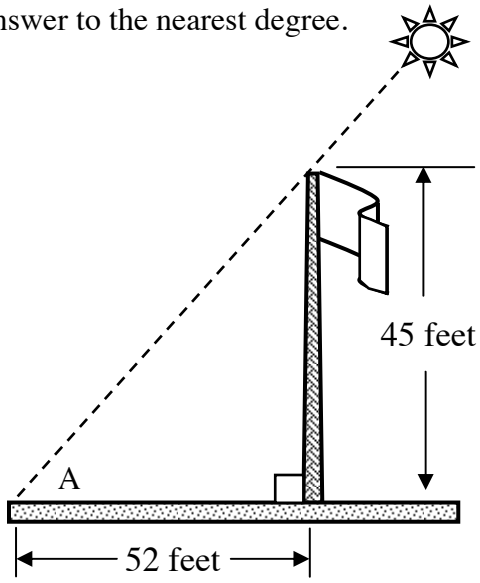
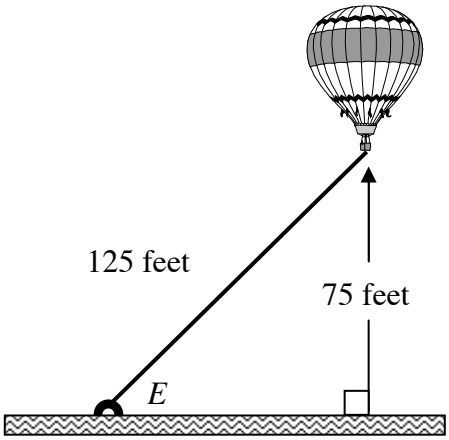


Exercise #5: A flagpole that is 45-feet high casts a shadow along the ground that is 52-feet long. What is the angle of elevation, A, of the sun? Round your answer to the nearest degree.



Exercise #6: A hot air balloon hovers 75 feet above the ground. The balloon is tethered to the ground with a rope that is 125 feet long. At what angle of elevation, E, is the rope attached to the ground? Round your answer to the nearest degree.



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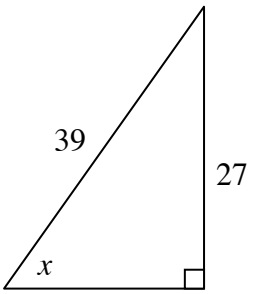
Solving For Missing Angles
Algebra 1 Homework

Skills

1. For the following right triangles, find the measure of each angle, x, to the nearest degree:

(a)



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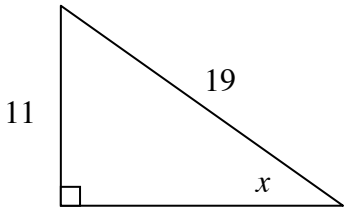

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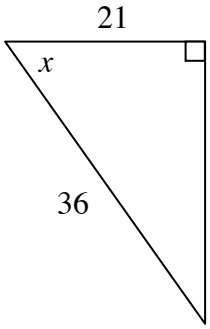

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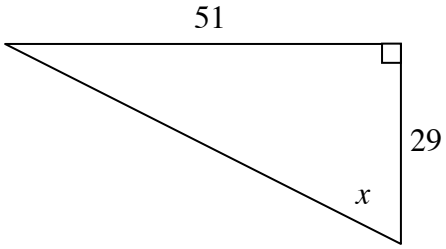
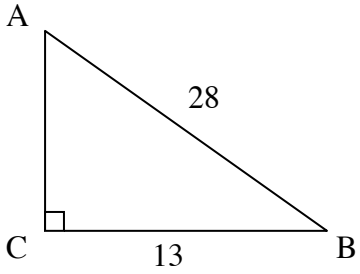


2. Given the following right triangle, which of the following is closest to $m\angle A$?

(1) 28° (3) 62°

(2) 25° (4) 65°



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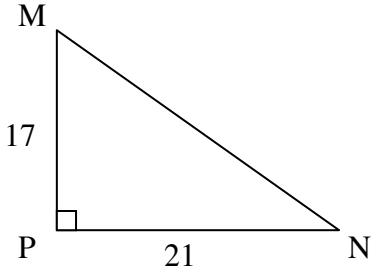
3. In the diagram shown, $m\angle N$ is closest to

(1) 51° (3) 17°

(2) 54° (4) 39°



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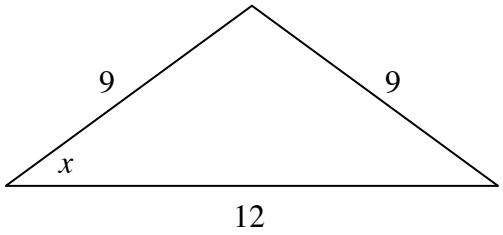
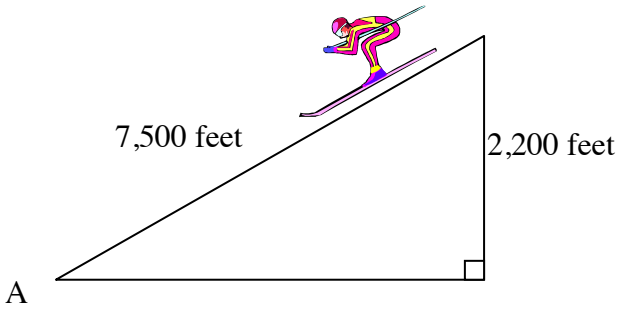
Applications

4. An isosceles triangle has legs measuring 9 feet and a base of 12 feet. Find the measure of the base angle, x, to the *nearest degree*. (Remember: Right triangle trigonometry can only be used in right triangles.)

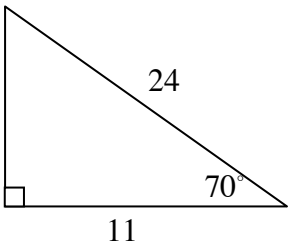


5. A skier is going down a slope that measures 7,500 feet long. By the end of the slope, the skier has dropped 2,200 vertical feet. To the nearest degree, what is the angle, A, of the slope?



Reasoning

6. Could the following triangle exist with the given measurements? Justify your answer.



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Inverse Trigonometric Ratios

Date_____ Period____

Find each angle measure to the nearest degree.

1) sin B = 0.4848

2) sin A = 0.5150

3) cos A = 0.7431

4) cos W = 0.6157

5) cos A = 0.5878

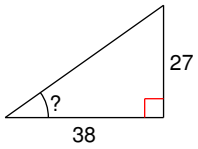
6) tan W = 19.0811

7) cos A = 0.4226

8) tan W = 0.5317

Find the measure of the indicated angle to the nearest degree.

9)



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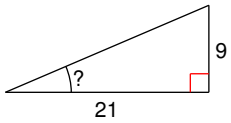

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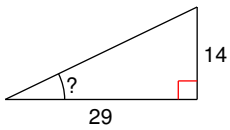

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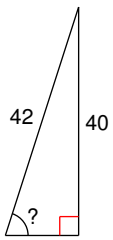

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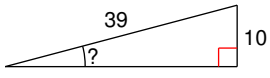

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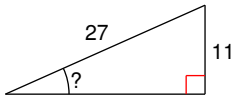

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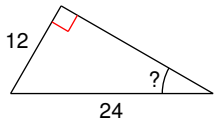

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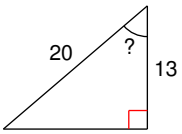

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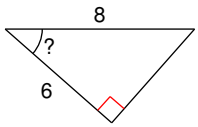

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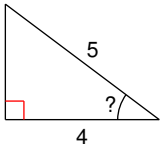

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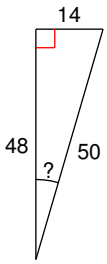

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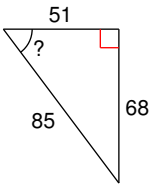

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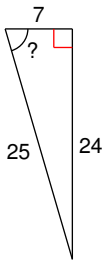

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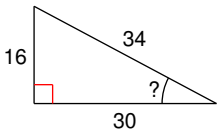

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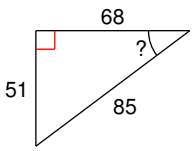

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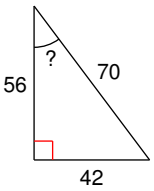


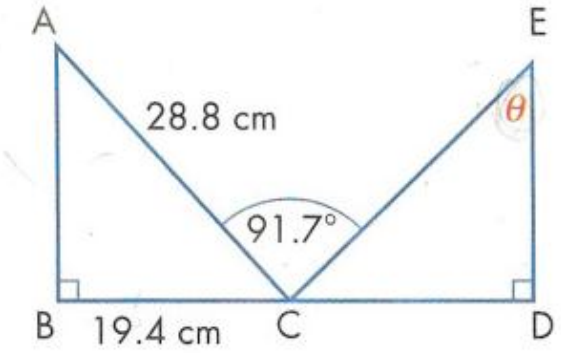
Critical thinking questions:

25) Find an angle x where $\sin x = \cos x$.

26) Draw and label all three sides of a right triangle that has a 40° angle and a hypotenuse of 10 cm.

4. Find the measure of $\angle\theta$, to the nearest tenth of a degree.

a)



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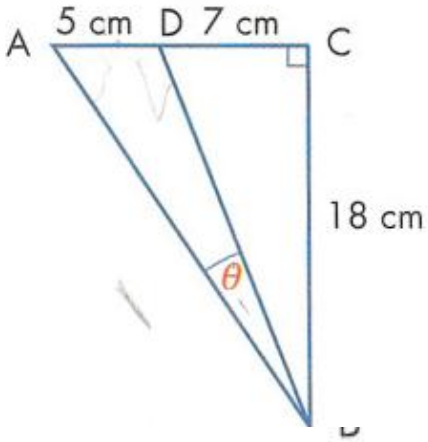

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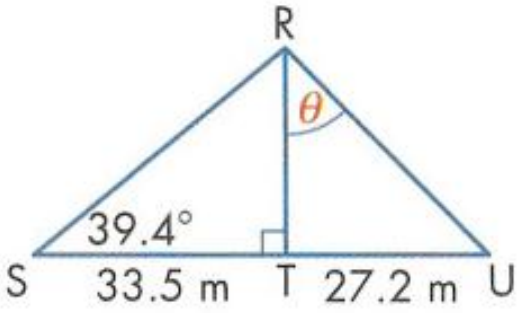

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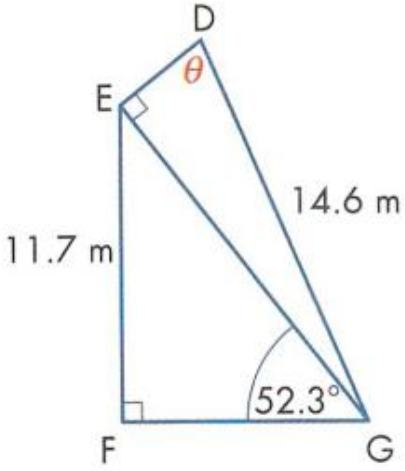
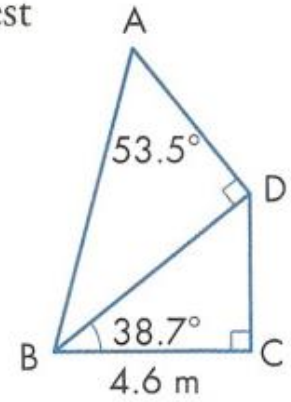


5. Find AB, to the nearest tenth of a metre.



6. Find RS, to the nearest tenth of a centimetre.