(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 $\dfrac{x}{5} = 8$

    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: _____

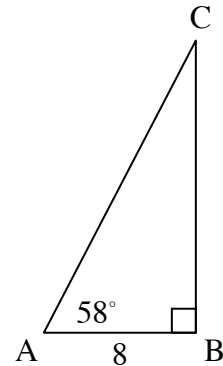## Using Trigonometry to Solve for Missing Sides
Algebra 1 Homework

Skill

In problems 1 through 3, determine the trigonometric ratio needed to solve for the missing side and then use this ratio to find the missing side.

1. In right triangle ABC, $m\angle A = 58°$ and $AB = 8$. Find the length of each of the following. Round your answers to the nearest *tenth*.
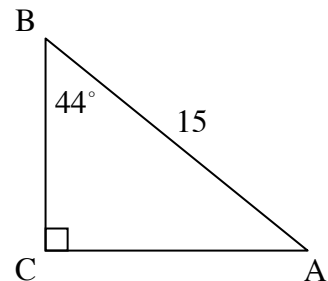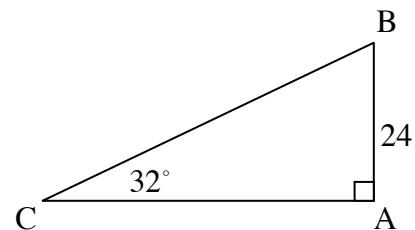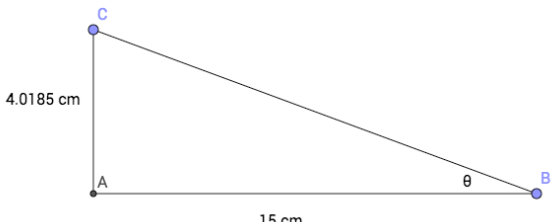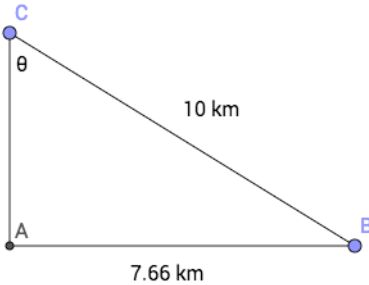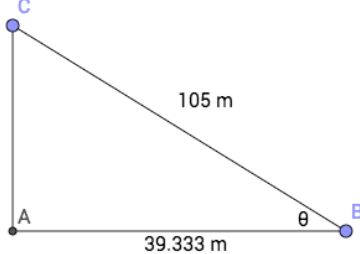
(a) BC

(b) AC

2. In right triangle ABC, $m\angle B = 44°$ and $AB = 15$. Find the length of each of the following. Round your answers to the nearest *tenth*.

(a) AC

(b) BC

3. In right triangle ABC, $m\angle C = 32°$ and $AB = 24$. Find the length of each of the following. Round your answers to the nearest *tenth*.

(a) AC

(b) BC

Opening Activity: Use our DATA TABLE of ratios & angles to help solve for the unknown angles

Angle θ	Opp/Hyp	Adj/Hyp	Opp/Adj		Angle θ	Opp/Hyp	Adj/Hyp	Opp/Adj
θ = 7°	.1219	.9925	.1228		θ = 48°	.7431	.6691	1.1101
θ = 12°	.2079	.9781	.2126		θ = 50°	.7660	.6428	1.1918
θ = 15°	.2588	.9695	.2679		θ = 52°	.7880	.6157	1.2799
θ = 21°	.3584	.9336	.3839		θ = 68°	.9272	.3746	2.4751
θ = 43°	.6820	.7313	.9325		θ = 89°	.9998	.0176	57.29
θ = 45°	.7071	.7071	1.0000					

Can you use your understanding of the above table to find the given angles?

How did you do it?

Name_____

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) $\cos W = 0.6157$
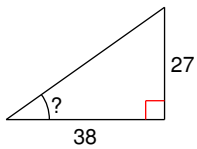
5) $\cos A = 0.5878$

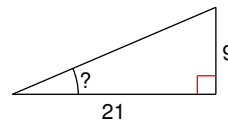6) $\tan W = 19.0811$

7) $\cos A = 0.4226$

8) $\tan W = 0.5317$

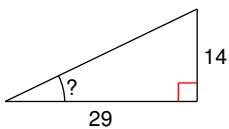**Find the measure of the indicated angle to the nearest degree.**

9)

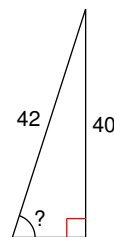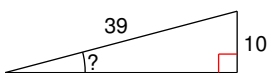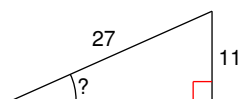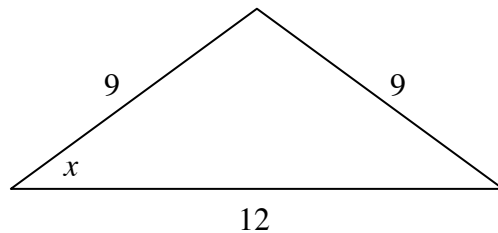10)



11)

12)

13)

14)

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.)
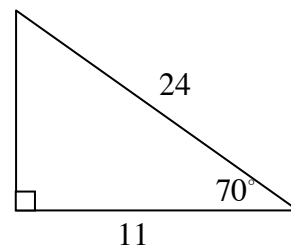
9   9

x

12

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?
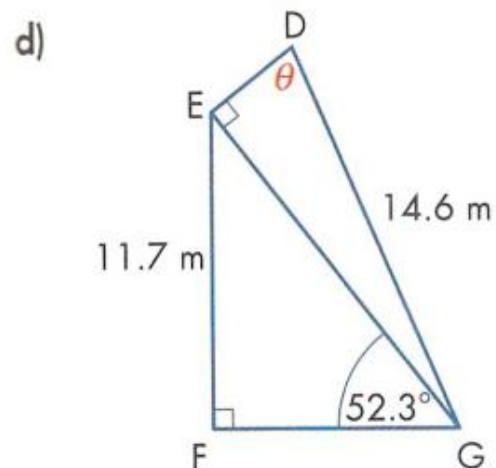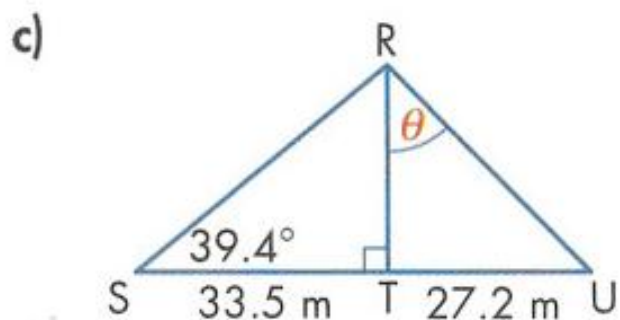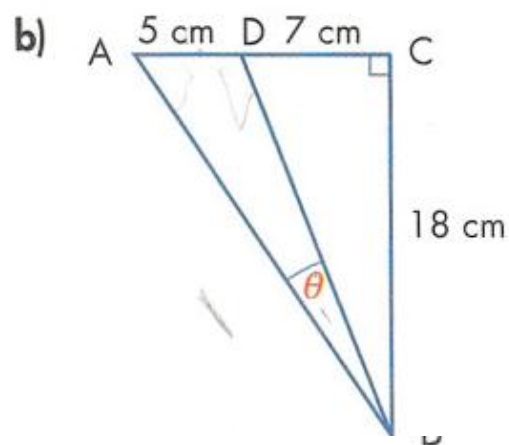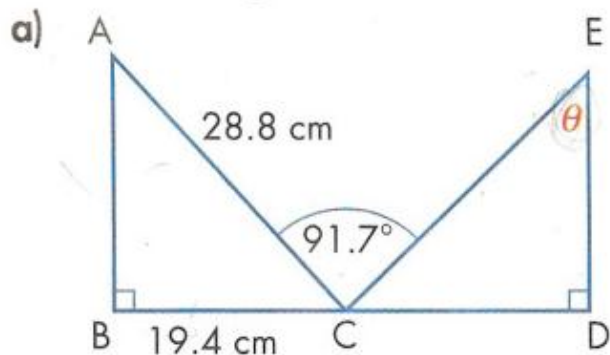
7,500 feet   2,200 feet

A
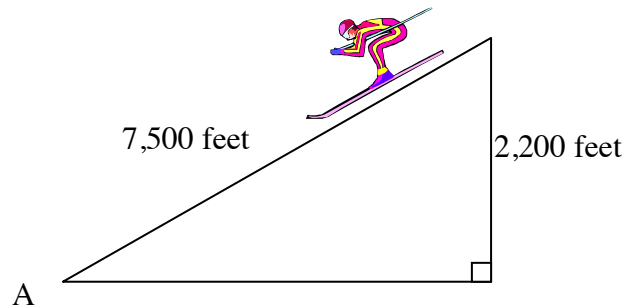
Reasoning

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

24

70°

11

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

a)

A   E

28.8 cm θ

91.7°

B   19.4 cm   C   D

d)

D

E θ

14.6 m

11.7 m

52.3°

F   G

b)

A   5 cm   D   7 cm   C

18 cm

θ

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

A

53.5°

D

38.7°

B   C

4.6 m

c)

R

θ

39.4°

S   33.5 m   T   27.2 m   U
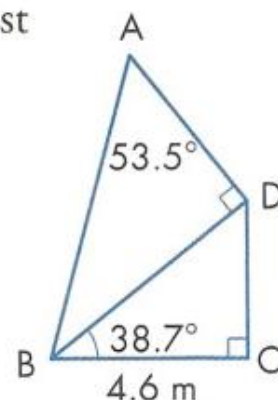
6. Find RS, to the nearest tenth of a centimetre.

P

57.8°

29.6°

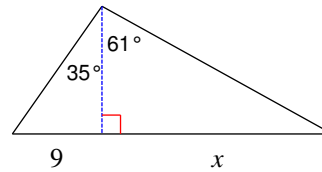Q   9.8 cm   R   S

Name_____
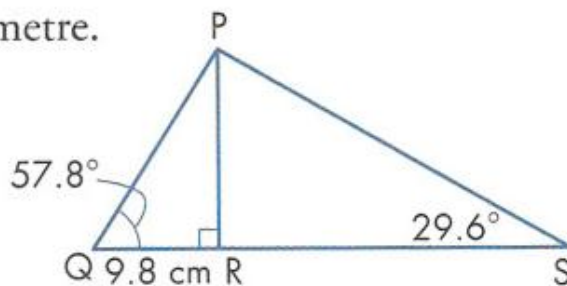
Multi-Step Trig. Problems

Date_____ Period____

Find the length of the side labeled x. Round intermediate values to the nearest tenth. Use the rounded values to calculate the next value. Round your final answer to the nearest tenth.
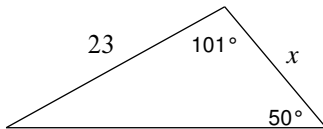
1)

38, 39°, 60°, x

2)

61°, 35°, 9, x

3)

23, 101°, 50°, x

4)
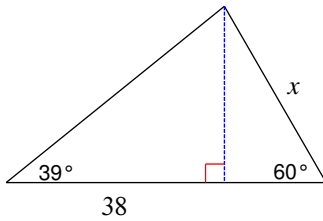
71°, 12, x, 44°

Find the area of each triangle. Round intermediate values to the nearest tenth. Use the rounded values to calculate the next value. Round your final answer to the nearest tenth.
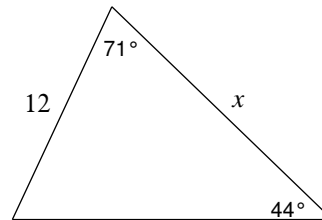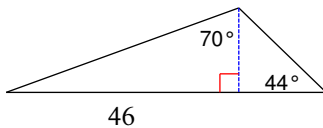
5)

70°, 44°, 46

6)

50°, 65°, 41