EQ: How do I use trigonometry to find missing side lengths of right triangles?

Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question

Week 7, Lesson 1

1. Warm Up
2. SRT.6 Quiz
3. Notes
4. Practice
5. Closure

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Find Missing Sides of Rt Triangles

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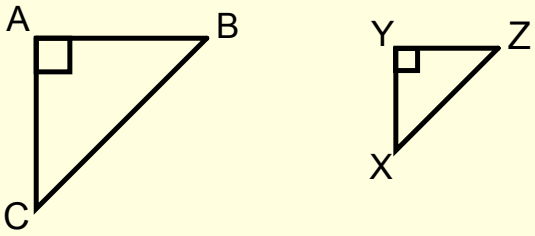
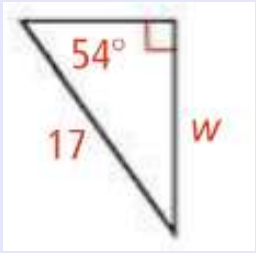
Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm Up:

Take a minute to review pages 40-41 and pages 42-43, as well as the word problem on page 44-45. Then, self-assess using the following questions:
1. Do you remember what SOH CAH TOA stands for? Can you identify opposite/adjacent sides? Can you set up proportions for similar triangles?
2. Can you solve the following problem?
The two triangles shown below are similar. If the cos B = 0.8 and the length of XZ is 30, what is the length of YZ?



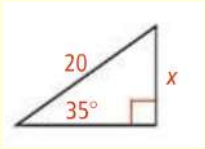
SRT.6 Quiz

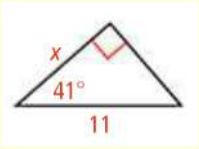
	- If an angle and one side of a right triangle are known, you can use trig functions to find the other side.
Example	Find the missing length, w. 
	step 1: set up a trig ratio (SOH CAH TOA)
	step 2: either nSolve or use the trig function in your calculator to solve it algebraically.

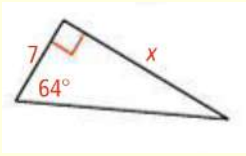
Summary:

Left-Side Practice

Find the missing value to the nearest tenth.



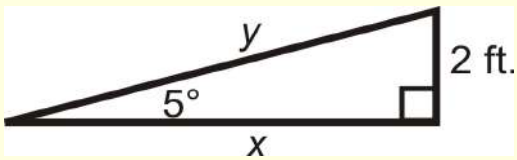




Designers of wheelchair ramps have to be aware of the fact that the ramp can't be too steep. Below is a sketch of a ramp that will be placed leading up to the courthouse downtown.

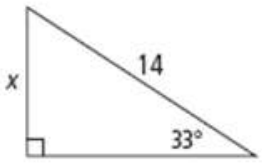
(a) What is the total length of ramp that will be needed?

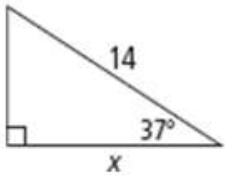
(b) How much space in front of the building will the ramp need to start?

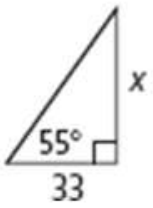


Name _____ pd _____ IAN page 34

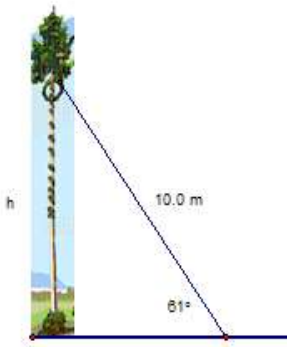
1. Find the value of x for each of the following.



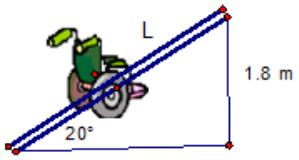




2. A damaged tree is supported by a wire 10.0 m long. The wire makes an angle of 61° with the ground. Calculate the height at which the wire is attached to the tree.

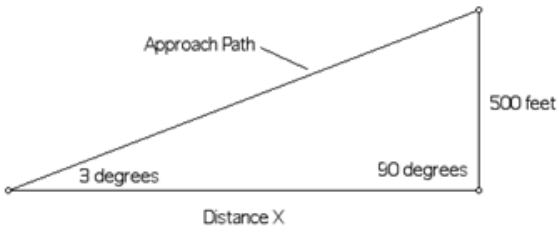


3. A ramp has an angle of inclination of 20°. It has a vertical height of 1.8 m. What is the length of the ramp?



4. A skateboarding ramp is 12 inches high and rises at an angle of 17°. How long is the ramp? Draw a picture to illustrate your answer.

5. An airplane's descent onto an airport runway uses trigonometry. Using the diagram below, what is the distance from the plane's current location to the airport runway?



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Right Side...

Write a summary that answers the essential question.

Left Side...

EQ: How do I use trigonometry to find missing side lengths of right triangles?

Week 7, Lesson 2
1. Warm Up
2. Left-Side Practice
3. TI-NSpire activity
4. Closure

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Find Missing Sides of Rt Triangles

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Warm Up:

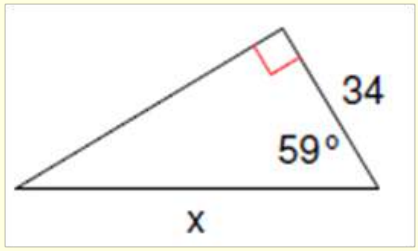
Draw the triangle. Label the opposite side, the adjacent side, and the hypotenuse in relation to 59°.

1. Write a trig ratio you could use to find x? (sin, cos, or tan)

1.5 Write second trig ratio that you could use to find x.

2. Using this trig ratio, set up your equation.

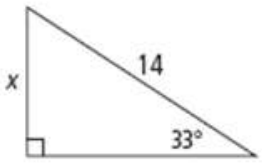
3. Solve for x.

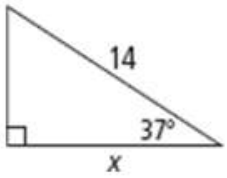


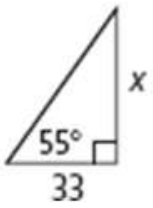
From a point on the ground 25 feet from the foot of a tree, the angle of elevation of the top of the tree is 32°. Find to the *nearest foot,* the height of the tree.

Name _____ pd _____ IAN page 34

1. Find the value of x for each of the following.







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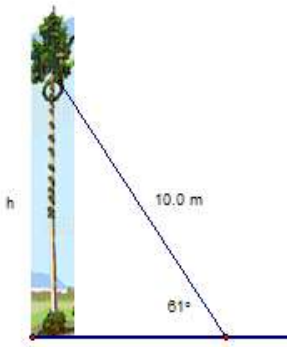

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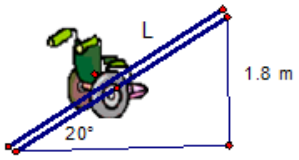

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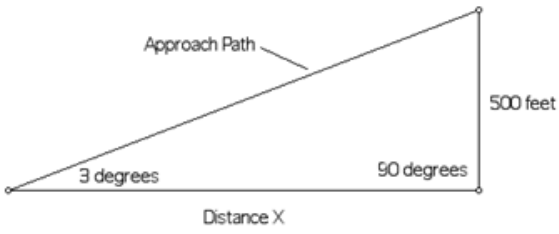
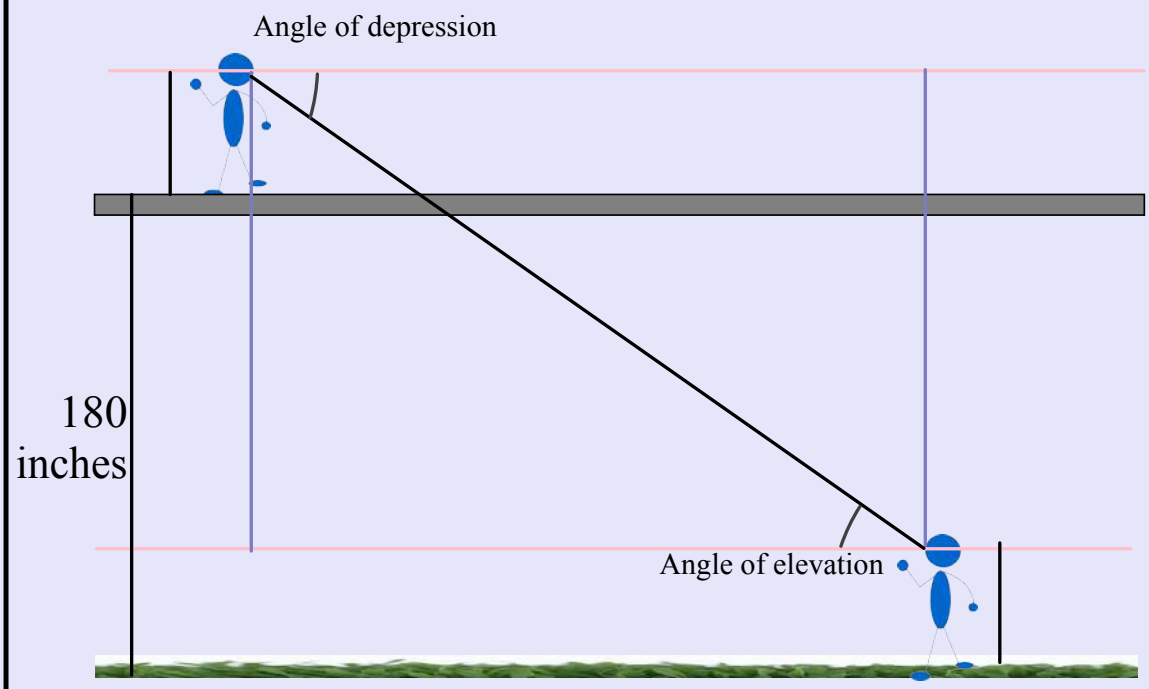


Notes Notes

Angle of Elevation/Depression



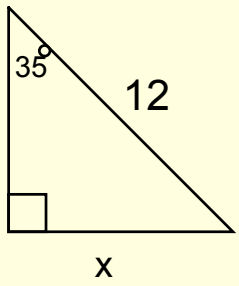
Ex 1

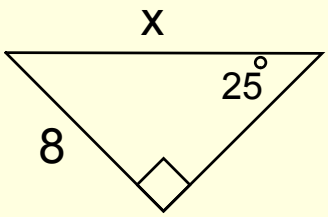
From the top of a barn 25 feet tall, you see a cat on the ground. The angle of depression of the cat is 40º. How many feet, to the *nearest foot*, must the cat walk to reach the barn?

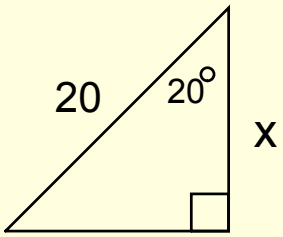
Summary:

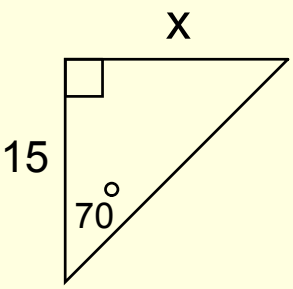
Left-Side Practice

What are all of the ways to find the value of x in the following triangles?

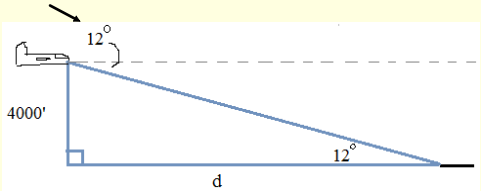






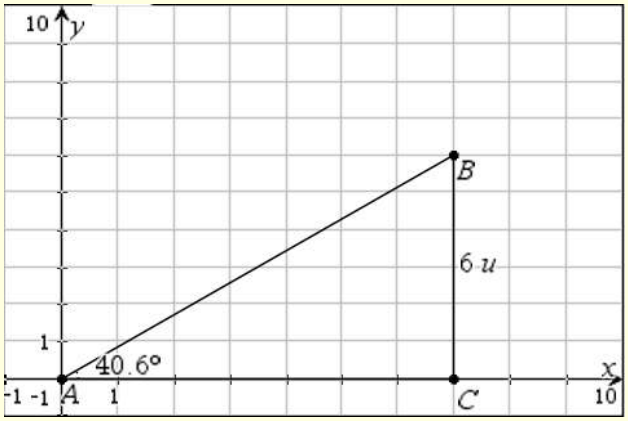


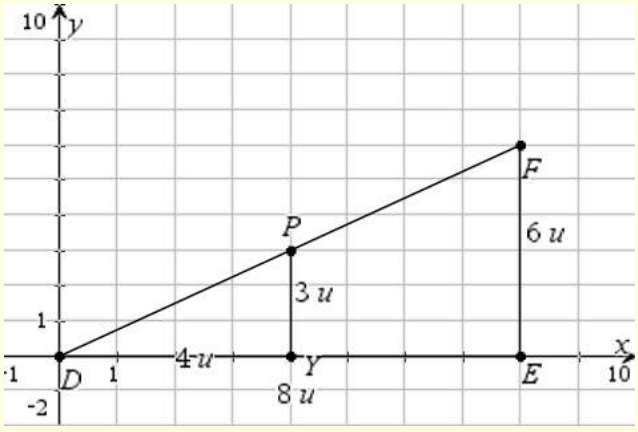
we call this "the angle of depression"

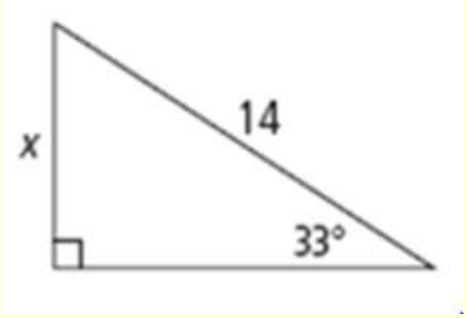


TI-NSpire Activity

Trig to Find Sides







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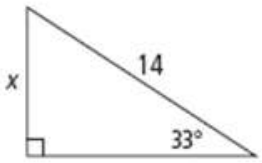
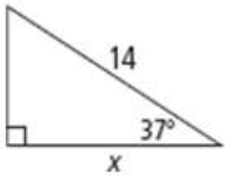
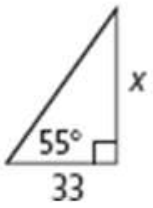
1. Find the value of x for each of the following.







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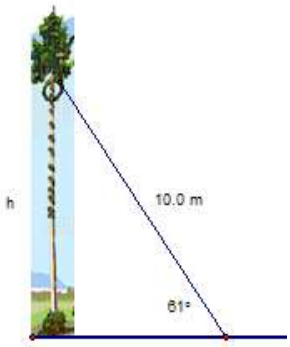

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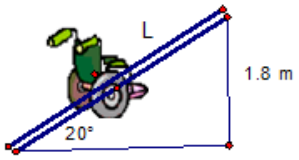

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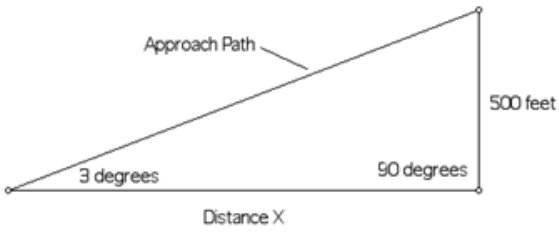

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Right Side...

Write a summary that answers the essential question.

Left Side...

EQ: How do I use trigonometry to find missing side lengths of right triangles?

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Week 7, Friday

1. Warm Up
2. Trig Investigation

not a new page!!!

34 35

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:

Name _____ Pd _____ IAN.page34

Trigonometry Investigation

Draw three different right triangles in the space below. Use a protractor or construct the perpendicular bisector to make sure you have an accurate right angle.

Label one triangle ABC (make B your right angle), one triangle MNP (make N your right angle), and one triangle XYZ (make Y your right angle).

Complete the following table:

Triangle	Side Lengths (cm)	Plug your values into the Pythagorean Theorem and simplify		Angle measures (use a protractor)	Complete the following trig ratios using your side lengths
ABC	AB =			$m\angle A =$	cos A = sin A = tan A =
	BC =			$m\angle B = 90°$	
	AC =			$m\angle C =$	cos C = sin C = tan C =
MNP	MN =			$m\angle M =$	cos M = sin M = tan M =
	NP =			$m\angle N = 90°$	
	MP =			$m\angle P =$	cos P = sin P = tan P =
XYZ	XY =			$m\angle X =$	cos X = sin X = tan X =
	YZ =			$m\angle Y = 90°$	
	XZ =			$m\angle Z =$	cos Z = sin Z = tan Z =

Answer the following questions.

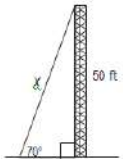
1. Did the Pythagorean Theorem work? In other words, when you plugged your side lengths into the formula, did $a^2 + b^2 = c^2$? _____

2. For $\triangle ABC$, you will use your calculator to see if trigonometry works.

(a) Use your calculator and find the cos A = _____
(b) Take your side lengths ratio for cos A and divide them using your calculator: _____
IF you made accurate measurements, these should be the same number.
(c) Repeat with C... cos C = _____
Take your side lengths ratio for cos C and divide them using your calculator: _____
IF you made accurate measurements, these should be the same number.

3. Given the diagram below, what is the value of x?

4. Some towers have to be stabilized by a wire. These are called "guy wires." In the picture below, a guy wire is attached to the top of a 50-ft antenna and makes a 70° angle with the ground. How much wire will be needed? Round to the nearest tenth.



5. List 10 facts you know about triangles that have a right angle.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

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Right Side...

Write a summary that answers the essential question.

Left Side...

EQ: How do I use trigonometry to find missing side lengths of right triangles?

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Week 7, Wednesday

1. Envelope Game!

not a new page!!!

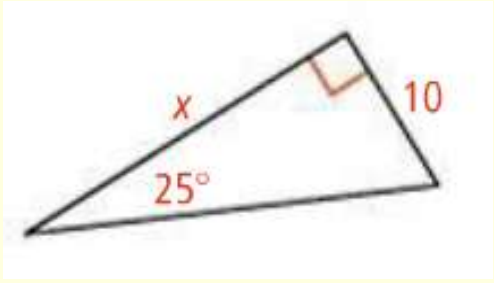
34 35

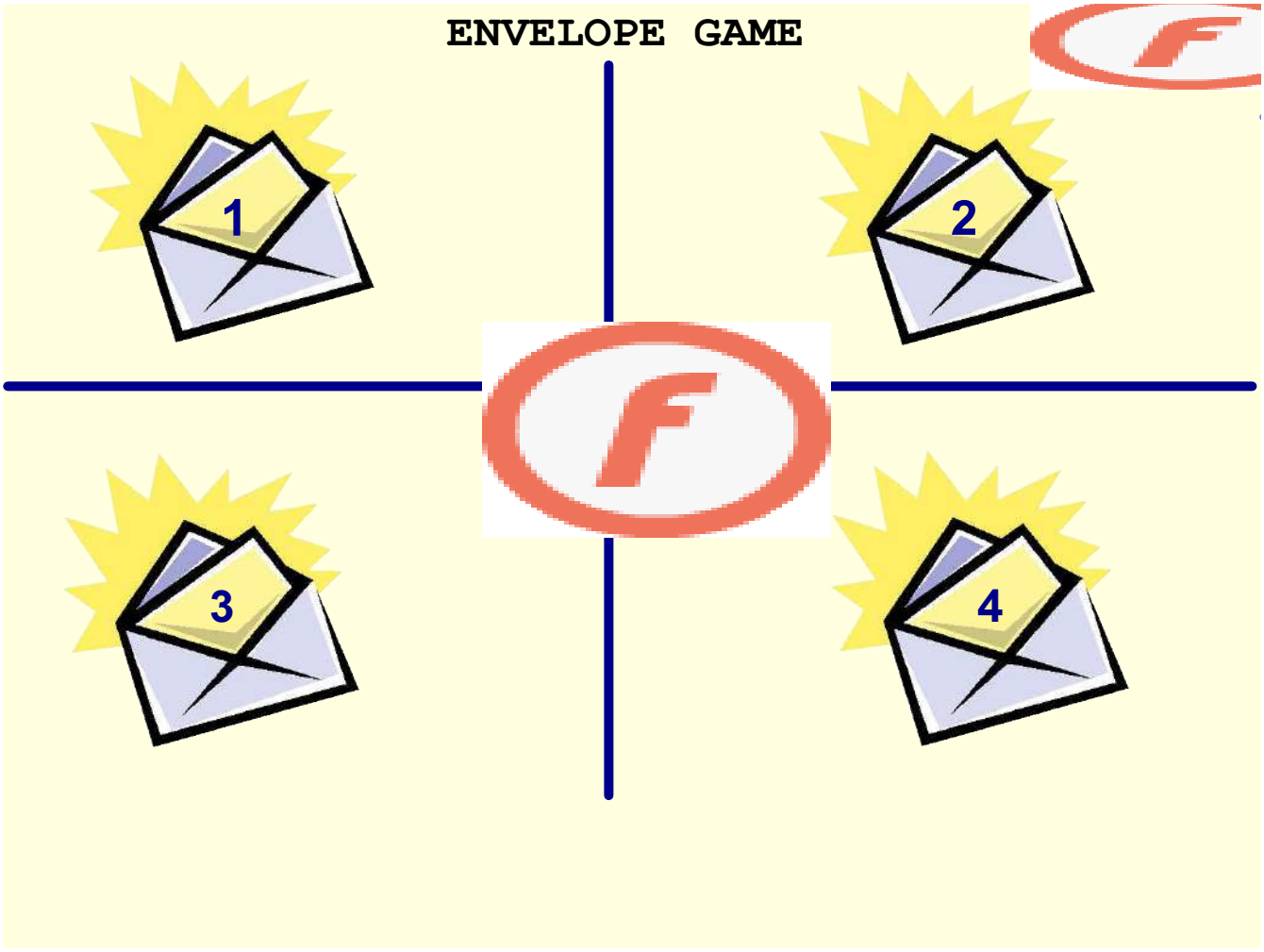
Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm Up:

Draw the triangle. Label the opposite side, the adjacent side, and the hypotenuse.

1. Which ratio would you use to find x? (sin, cos, tan)
2. Using this trig function, set up your ratio.
3. Solve for x.




ENVELOPE GAME
1
2
3
4

Name _____

Number:

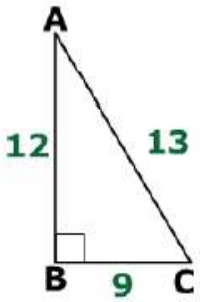
Envelope Game Worksheet

Part 1: Find the ratios for each of the following. Be sure to reduce your ratios!

1. Find the following ratios for $\angle A$.
(a) cos A

(b) sin A

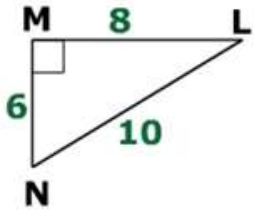
(c) tan A



2. Find the following ratios for $\angle N$.
(a) cos N

(b) sin N

(c) tan N



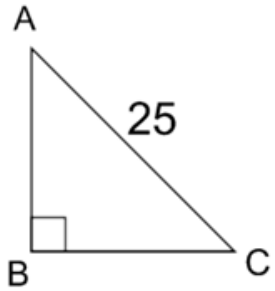
Part 2: Use proportions to solve the following problems.

3. Given the following trig ratios, what is the value of BC? _____

$\sin A = \frac{4}{5}$

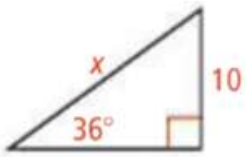
$\cos A = \frac{3}{5}$

$\tan A = \frac{4}{3}$



Part 3: Use trigonometry to solve the following problems.

4.



5.

A section of Filbert Street in San Francisco rises at an angle of about 17°. If you walk 150 ft up this section, what is your vertical rise? Round to the nearest foot.