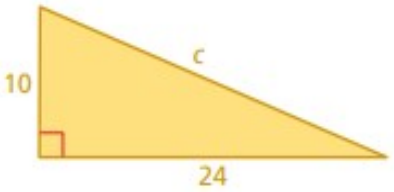
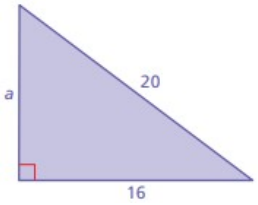
Review of Pythagorean Thm. And Intro to Trig.

$a^2 + b^2 = c^2$ Name _____

Warm Up Use the Pythagorean Theorem to find the missing side of the Right Triangle.





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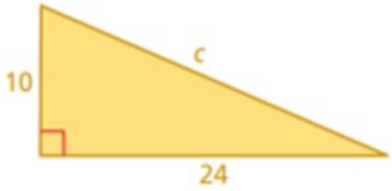

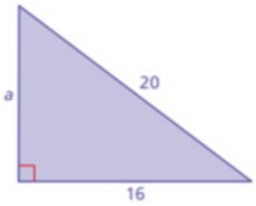

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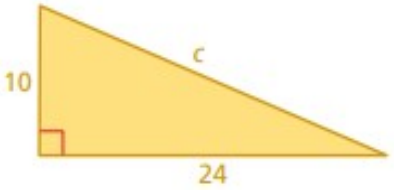

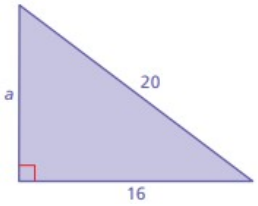

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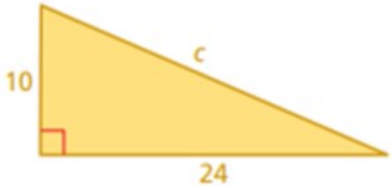
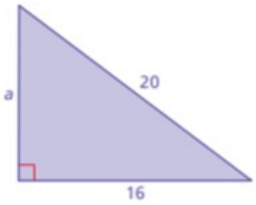




Review of Pythagorean Thm. And Intro to Trig.

Construction, proof, and conjecture of the Pythagoras' Theorem.

Required Questions:

› What tools will you need?

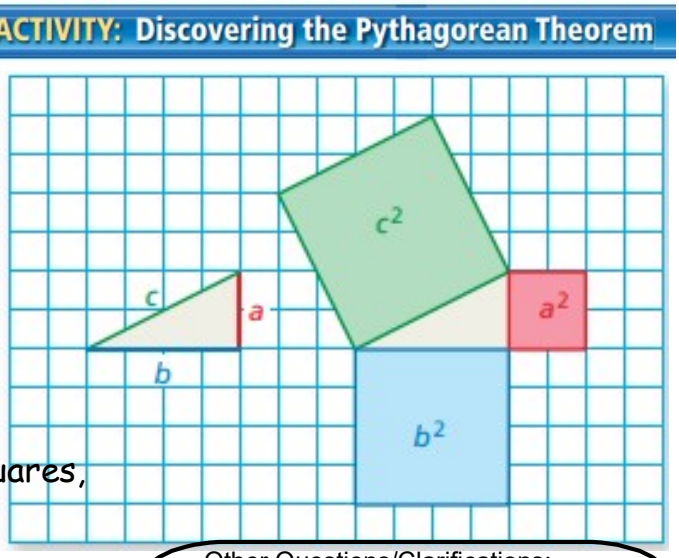
› How will you know your Triangle is a right Triangle?

› How will you know your Squares, are Squares?

› What makes a Square, a Square?

› What needs to be measured?

$a^2 + b^2 = c^2$



Other Questions/Clarifications:

QUESTIONS TO ANSWER, BASED ON YOUR MODEL:

1. What are the measurements of each of the 4 sides of your squares:

a^2 = _____, _____, _____, _____ b^2 = _____, _____, _____, _____

c^2 = _____, _____, _____, _____

2. What is the area of each one of the Squares?

a^2 = ____ b^2 = ____ c^2 = ____

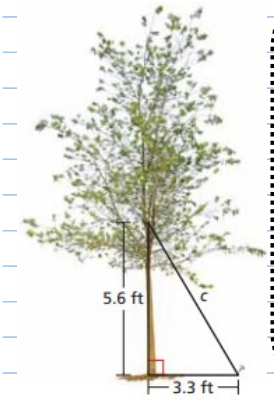
3. Does $a^2 + b^2 = c^2$? (How close were you?)

4. **Conjecture.** Write 4 sentences about this experience. Describe each square, its relation to the Right Triangle, mention how Area is involved, and other important details along the way. [Be ready to share]

Pythagorean Theorem & Similarity Review

1. APPLICATION:

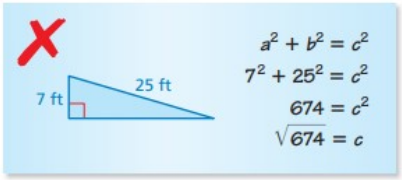
How long is the wire that supports the tree?



show work here

TREE SUPPORT How long is the wire that supports the tree?

2. FIND THE ERROR



Describe the error in words:

_____

_____

_____

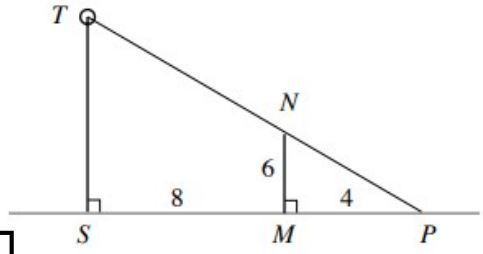
_____

then show proper steps to correct answer:

Similar Figures
rvw (Geom.A)

In some situations, one similar triangle will overlap another. This usually means that one angle is shared by both triangles.

EXAMPLE 3 A man, 6 feet tall, is walking away from a street light. If the length of the man's shadow is 4 feet when he is 8 feet from the light, then how high is the light?

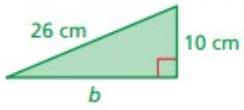


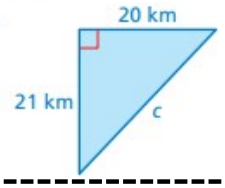
Set up: ____ = ____

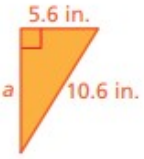
Main concept: Set up your proportion equation with corresponding sides, then cross multiply.

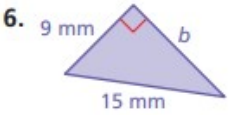
Review of Pythagorean Thm. And Intro to Trig.

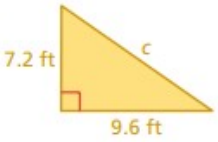
"ALL YOU." Find the length of the missing side of the right triangles.

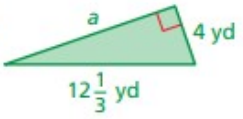
3. 

4. 

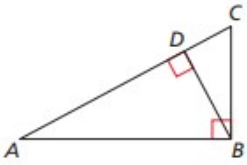
5. 

6. 

7. 

8. 

9. **REASONING** Use the diagram. Decide which proportions are true. Select all that apply.

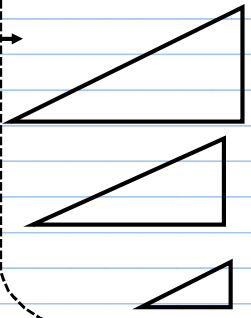


Ⓐ $\frac{DB}{DC} = \frac{DA}{DB}$ Ⓑ $\frac{BA}{CB} = \frac{CB}{BD}$

Ⓒ $\frac{CA}{BA} = \frac{BA}{CA}$ Ⓓ $\frac{DB}{BC} = \frac{DA}{BA}$

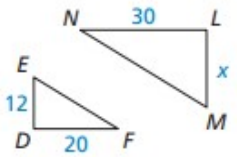
LABEL THESE TRIANGLES

EXTRACTED TO HELP YOU

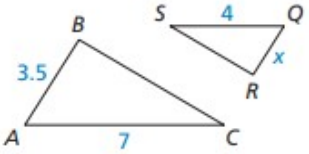


Find the value of x. *(Section 8.1)*

26. $\triangle DEF \sim \triangle LMN$



27. $\triangle ABC \sim \triangle QRS$

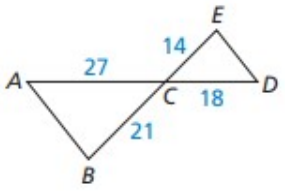


Review of Pythagorean Thm. And Intro to Trig.

Warm Up

Name _____

1. Write a proportion to show the Triangles are similar, and (2). prove the proportion is True by cross-multiplication. 3. Finally, write a statement of similarity about the Triangles using "Geometry notation ~ "



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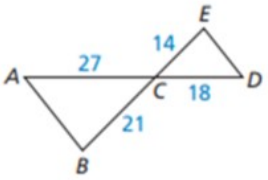

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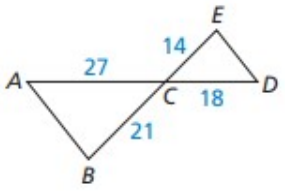

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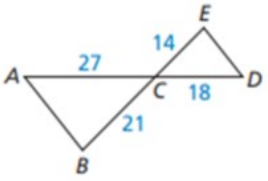
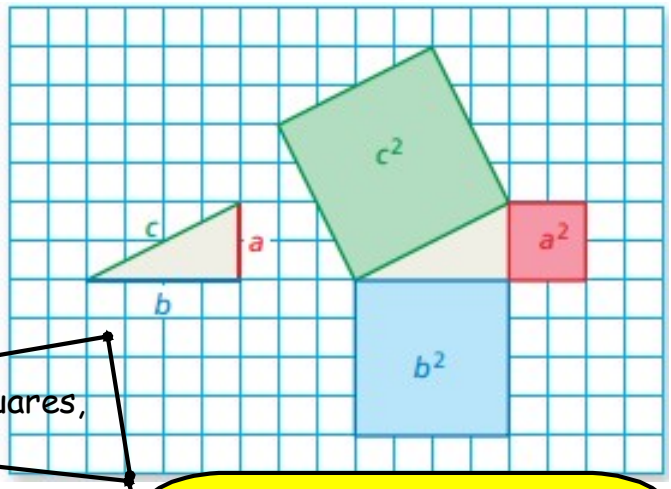


Adriant Sanchez Unit Sample Geometry B

Review of Pythagorean Thm. And Intro to Trig.

Construction, proof, and conjecture of the Pythagoras' Theorem.

ACTIVITY: Discovering the Pythagorean Theorem



Required Questions:

› What tools will you need?

› How will you know your Triangle is a right Triangle?

› How will you know your Squares, are Squares?

› What makes a Square, a Square?

› What needs to be measured?

ANSWER EACH ONE, FINISH DETAILING PRODUCT

$a^2 + b^2 = c^2$

Only to be used for arranged hours

Ans:	Name Ans:

Another way to check if a proportion is true, is to use "cross-products" or "cross multiplication." By multiplying the diagonals of the proportion, these cross-products must be equal. Example: In $\frac{20}{25} = \frac{4}{5}$, the cross products (products of the diagonals) are,

$20 \cdot 5$ *and* $25 \cdot 4$. Do you see where these products come from in the proportion?

And are these cross-products equal? Does $20 \cdot 5 = 25 \cdot 4$?

TASK 3: Use Cross-Products/Cross-Multiplication, to verify if the following proportions are true.

If $\frac{a}{b} = \frac{c}{d}$, *then* $a \cdot d = b \cdot c$

Get Ready for Competition Thursday.

2 Teams will be made,

you will relay to the board,

using problems from "side 2."

GET READY FOR A NUMBER TALK:

THINKING AND SHARING.

36 109

49 108

119 48

126 124

LESSON
FOLLOWS
TRIGONOMETRY INTRO **:D**

Review of Pythagorean Thm. And Intro to Trig.

The Culture of Trigonometry

Trigonometry is a branch of Geometry, it relates Right Triangles to many-many life applications, math situations, functions. It can use Algebra to solve problems, or show graphs, meaning variables like x, yet it can also use Greek letters as variables to represent Angles.

Lastly, it is all based on the concept of Ratios of the length of Triangles, and their constant relation to their angles of reference, based on which side is Adjacent, Opposite, and the Hypotenuse.

CLO: To introduce the culture of Trigonometry based on the following **vocabulary**: Ratio, Angle of Reference, Theta, Adjacent, Opposite, Hypotenuse. Students will understand and experience the relationship of the aforementioned.

RATIO:

What is the ratio of "Girls to boys" today in the class? ___

Ratio of 12th graders in this class to underclassmen ? ___

Ratio of your hand to your arm ? ____

Your cell phone's width to the desk' is (about) ___times smaller,

And, your cell phone's length is (about) ___ times smaller.

SO WHAT IS RATIO? ...

because in Trigonometry, there are 3 famous ratios: Tangent, SIne, and Cosine.

THE GREEK ALPHABET

α	A	alpha	a
β	B	beta	b
γ	Γ	gamma	g
δ	Δ	delta	d
ε	E	epsilon	e
ζ	Z	zeta	z
η	H	eta	ē
θ	Θ	theta	th
ι	I	iota	i
κ	K	kappa	k
λ	Λ	lambda	l
μ	M	mu (moo)	m
ν	N	nu (noo)	n
ξ	Ξ	xi (ksee)	x
ο	O	omicron	o
π	Π	pi (pee)	p
ρ	P	rho	r, rh
σ, ς	Σ	sigma	s
τ	T	tau	t
υ	Y	upsilon	u, y
φ	Φ	phi (phee)	ph
χ	X	chi (khee)	ch/kh
ψ	Ψ	psi (psee)	ps
ω	Ω	omega	ō

kOol fACtOR:

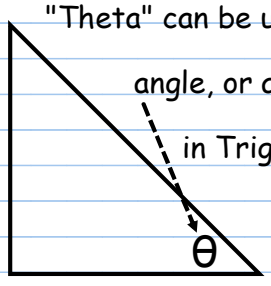
What is your Name in Greek?

My Example: Mr. A. Sanchez

Μρ. Α. Σανχεζ

Your Turn. Your Name:

"Theta" can be used as an unknown angle, or angle of reference in Trigonometry.

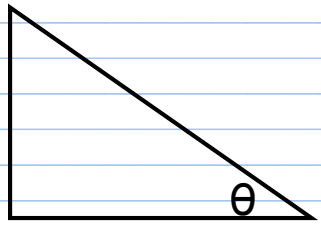


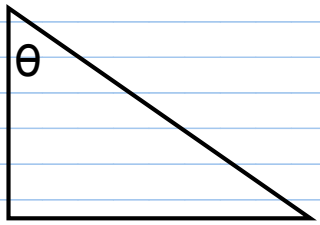
Review of Pythagorean Thm. And Intro to Trig.

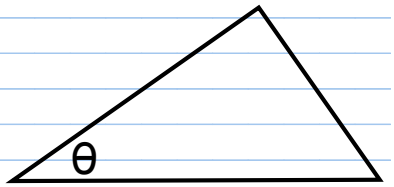
In Trig. you first need to learn how to identify and label according to the Angle of Reference

ADJACENT, OPPOSITE, HYPOTENUSE

Let's label the Right Triangles below as "ADJ. OPPs. and HYP." to the angle Theta.

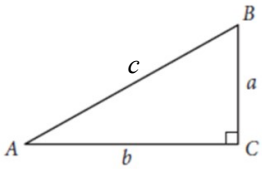




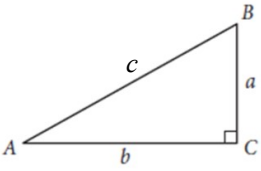


Now given Triangle ABC, and their respective sides a, b,c;

label the Triangle if Angle A is the Angle of reference.



Label the Triangle according to <B:



The "Adjacent side" is the _____

Describe determining the "Opposite side." _____

SOH-CAH-TOA

TOA →

The tangent ratio is a tool used with right triangles that allows one to find the length of the sides of a triangle given the degree of its angles. It can also be used to find the degrees of its angle given the length of two of its sides.

(TOA = Brave in Hawaiian)

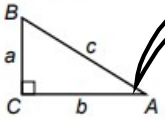
Tangent Ratio

Words: If A is an acute angle of a right triangle,

$$\tan A = \frac{\text{measure of the leg opposite } \angle A}{\text{measure of the leg adjacent to } \angle A}.$$

Symbols: $\tan A = \frac{a}{b}$

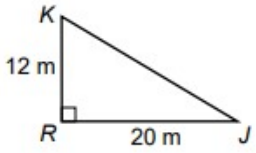
Model:



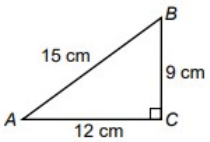
"Tangent of Angle A."

WHY IS THE TANGENT RATIO OF A RIGHT TRIANGLE REFERRED TO AS "TOA?"

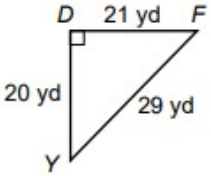
FIND THE TANGENT RATIOS ... OF:



Tan K = __ Tan J = __



Tan A = __ Tan B = __



Tan Y = __ Tan F = __

Adriant Sanchez Unit Sample Geometry B

Review of Pythagorean Thm. And Intro to Trig.

SOH-CAH-TOA

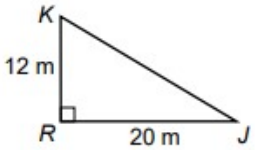
CAH → $\cos A = \dfrac{\text{length of leg adjacent to } \angle A}{\text{length of hypotenuse}}$

Cosine is the Ratio that ...

(CAH = Dude in Hawaiian)

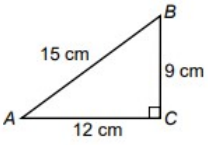
WHY IS THE Cosine RATIO OF A RIGHT TRIANGLE REFERRED TO AS "CAH?"

FIND THE Cosine RATIOS OF:



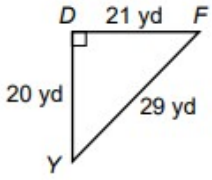
Do we know what the Hypotenuse is?..

Cos K = __ Cos J = __



Cos A = __

Cos B = __



Cos Y = __

Cos F = __

SOH-CAH-TOA

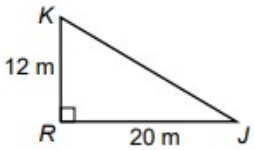
SOH → $\sin A = \dfrac{\text{length of leg opposite } \angle A}{\text{length of hypotenuse}}$

Sine is the Ratio that ...

(SOH = "Calm Down" in Hawaiian)

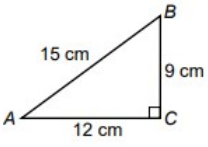
WHY IS THE Sine RATIO OF A RIGHT TRIANGLE REFERRED TO AS "SOH?"

FIND THE Sine RATIOS OF:



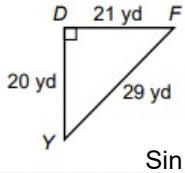
Do we know what the Hypotenuse is?..

Sin K = __ Sin J = __



Sin A = __

Sin B = __



Sin Y = __

Sin F = __

SOH-CAH-TOA

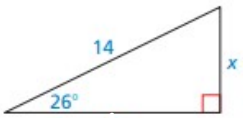
in Hawaiian is a sentence that means what :?) ...

Review of Pythagorean Thm. And Intro to Trig.

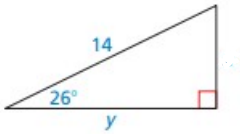
Using SOH-CAH-TOA to find lengths of Right Triangles:

1. Label the Triangle	2. Choose from SOH-CAH-TOA
3. Substitution	4. Solve

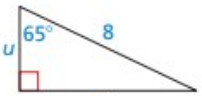
1.A Find the variable.



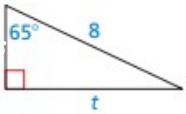
1.B. Find the variable.



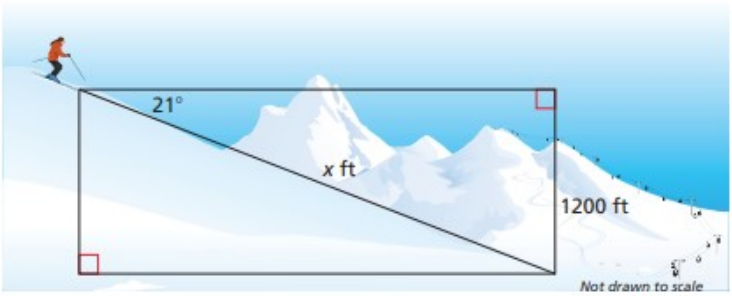
2.A



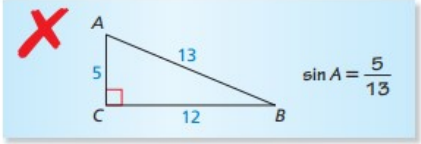
2.B.



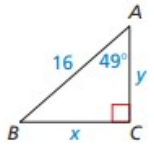
3. You are skiing on a mountain with an altitude of 1200 feet. The angle of depression is 21°. Find the distance x you ski down the mountain to the nearest foot.



4. **ERROR ANALYSIS** Describe and correct the error in finding $\sin A$.



5. **MAKING AN ARGUMENT** Your friend uses the equation $\sin 49° = \frac{x}{16}$ to find BC. Your cousin uses the equation $\cos 41° = \frac{x}{16}$ to find BC. Who is correct? Explain your reasoning.



Review of Pythagorean Thm. And Intro to Trig.

Name _____

WARM UP

Solve the following proportions for x. Show steps:

1. $\frac{x}{12} = 0.567$

2. $0.234 = \frac{6}{x}$

Name _____

WARM UP

Solve the following proportions for x. Show steps:

1. $\frac{x}{12} = 0.567$

2. $0.234 = \frac{6}{x}$

Name _____ ____ 4 tst. pts.

"Trig.Calculations Quiz"

Calculate the trig expressions and round to the nearest decimal.

1. Find (Sin 30°)
2. Find 8(Sin 80°)
3. Find 50(Cos 26 °)
4. Find 4(Cos 30°)

Name _____

"Trig.Calculations Quiz"

Calculate the trig expressions and round to the nearest decimal.

1. Find (Cos 30°)
2. Find 8(Cos 80°)
3. Find 50(Sin 26 °)
4. Find 4(Sin 30°)

____ 4 tst. pts.

Review of Pythagorean Thm. And Intro to Trig.

Name _____

4 tst. pts.

"Trig.Calculations Quiz"

Calculate the trig expressions and round to the nearest decimal.

1. Find (Sin 50°)
2. Find 8(Sin 45°)
3. Find 50(Cos 62 °)
4. Find 4(Cos 80°)

Name _____

"Trig.Calculations Quiz"

Calculate the trig expressions and round to the nearest decimal.

1. Find (Cos 50°)
2. Find 8(Cos 54°)
3. Find 50(Sin 62 °)
4. Find 4(Sin 80°)

4 tst. pts.

Name _____

4 tst. pts.

"Trig.Calculations Quiz"

Calculate the trig expressions and round to the nearest decimal.

1. Find (Sin 50°)
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"Trig.Calculations Quiz"

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4 tst. pts.

Adriant Sanchez Unit Sample Geometry B

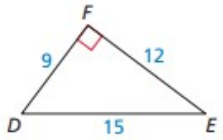
Review of Pythagorean Thm. And Intro to Trig.

Monitoring Progress and Modeling with Mathematics

[COLLABORATION ASSIGNED PROBLEMS] **1 PRODUCT PT.**

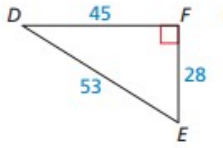
In Exercises 3–8, find sin *D*, sin *E*, cos *D*, and cos *E*. Write each answer as a fraction and as a decimal rounded to four places.

3.

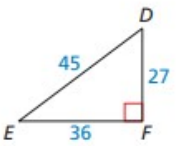


4.

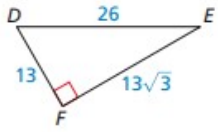
5.



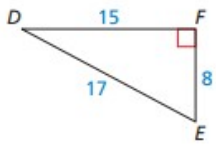
6.



7.

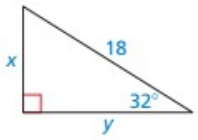


8.

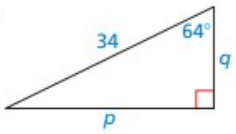


In Exercises 17–22, find the value of each variable using sine and cosine. Round your answers to the nearest tenth.

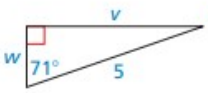
17.



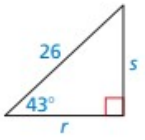
18.



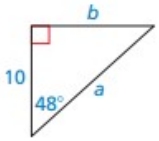
19.



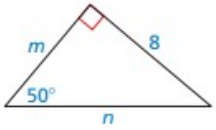
20.



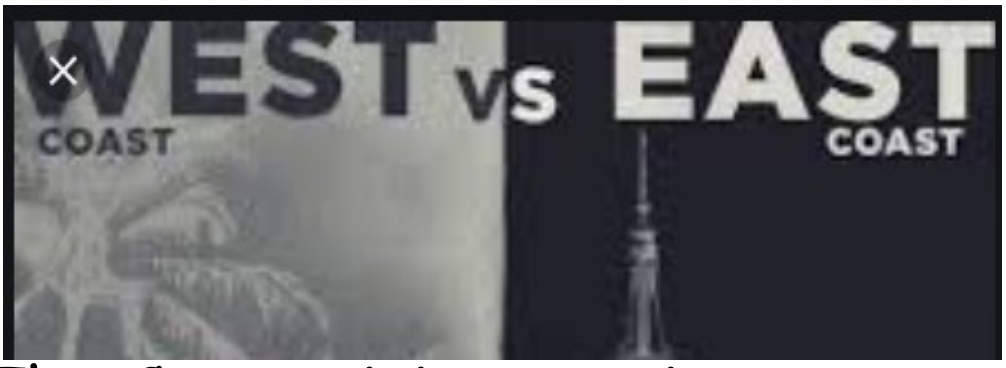
21.



22.



1. **Label the Triangle**
2. **Choose from SOH-CAH-TOA**
3. **Substitution**
4. **Solve** (One variable at a time)



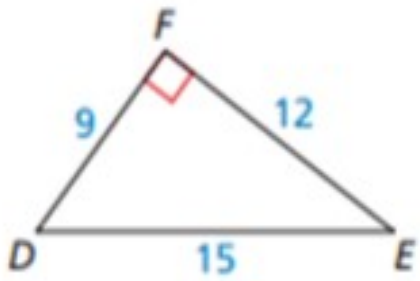
The Competition continues,

"beast coast" vs "best coast."

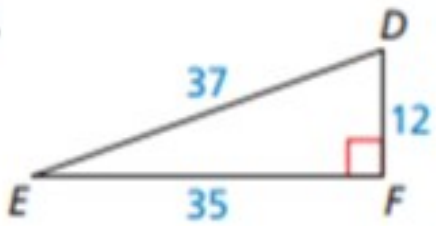
* Balance teams
* Relay approach

*All participate. *Winner gets Scholar for Treats next week $$

3.



4.



Group Names _____ Problem : _____

GROUP CHALLENGE PROBLEMS CHECKLIST:

__DIAGRAM/SKETCH

__ LABELS (ADJ, OPPs, HYP)

_CORRECT SET UP & WORK (SOH-CAH-TOA)

__ Clear Neat Steps to Solution.

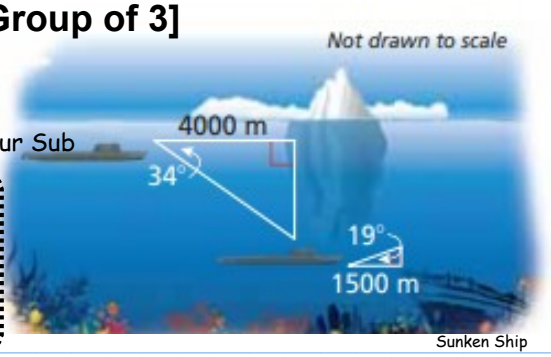
__Proper answer Explanation or Sentence(s)

Present your problem(s)

Review of Pythagorean Thm. And Intro to Trig.

MODELING WITH MATHEMATICS Submarines use sonar systems, which are similar to radar systems, to detect obstacles. Sonar systems use sound to detect objects under water. **[Group of 3]**

?'s/Ideas/Clarifications

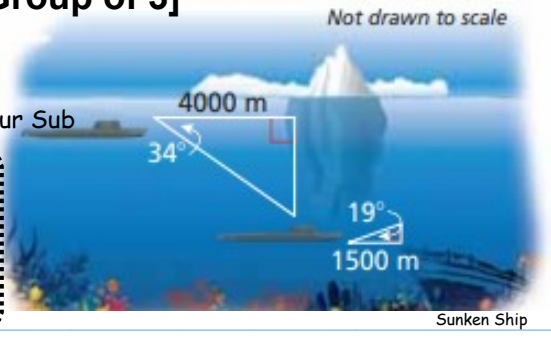


a. You are traveling underwater in a submarine. The sonar system detects an iceberg 4000 meters ahead, with an angle of depression of 34° to the bottom of the iceberg. How many meters must the submarine lower to pass under the iceberg?

b. The sonar system then detects a sunken ship 1500 meters ahead, with an angle of elevation of 19° to the highest part of the sunken ship. How many meters must the submarine rise to pass over the sunken ship?

MODELING WITH MATHEMATICS Submarines use sonar systems, which are similar to radar systems, to detect obstacles. Sonar systems use sound to detect objects under water. **[Group of 3]**

?'s/Ideas/Clarifications



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Review of Pythagorean Thm. And Intro to Trig.

[Individual or Partners]

An airplane is flying at an altitude of 11,000 feet. The pilot wants to make a smooth final descent to runway at an angle of depression of 5°. How far from the runway should the pilot begin the descent?

?'s/Ideas/Clarifications

You want to take a picture of a statue on Easter Island, called a *moai*. The moai is about 13 feet tall. Your camera is on a tripod that is 5 feet tall. The vertical viewing angle of your camera is set at 90°. How far from the moai should you stand so that the entire height of the moai is perfectly framed in the photo?

?'s/Ideas/Clarifications

Review of Pythagorean Thm. And Intro to Trig.

According to Chinese legend, General Han Xin (Han dynasty 206 B.C - 220 A.D.) flew a kite over the palace of his enemy to determine the distance between his troops and the palace. If the general let out 1000 meters of string and the kite was flying at a 40° angle of elevation, how far away was the palace from General Han Xin's position?

?'s/Ideas/Clarifications

Study Skills

Form a Weekly Study Group, Set Up Rules

Consider using the following rules.

- Members must attend regularly, be on time, and participate.
- The sessions will focus on the key math concepts, not on the needs of one student.
- Students who skip classes will not be allowed to participate in the study group.
- Students who keep the group from being productive will be asked to leave the group.

Link to Quiz