6.6 Applications

Warm-Up Notecard

Find cosB for a triangle with sides: a = 21, b = 42, c = 31

A. -181/651 B. 571/651 C. -311/441 D. 181/651

About Me

1. You can live in a fictional universe of your choice - but you are in no way extraordinary or change. Would you do it?
2. Would you rather always have to say everything on your mind or never be able to speak again?

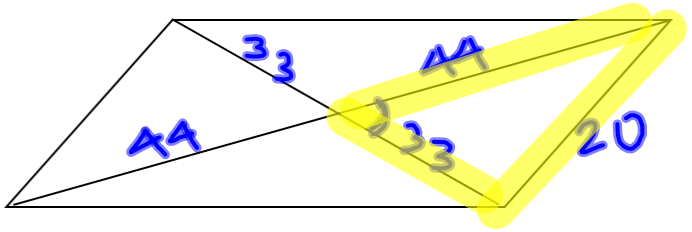
6.6 Applications

EQ: How do I solve word problems with oblique triangles?

1. The diagonals of a parallelogram are 88 cm and 66 cm. The shorter side is 20 cm. Find the acute angle formed by the two diagonals. {nearest tenth}

→ bisect one another

smaller



SSS → cosines

$20^2 = 44^2 + 33^2 - 2(44)(33)\cos A$

$400 = 3025 - 2904\cos A$

$-3025 \quad -3025$

$-2625 = -2904\cos A$

$-2904 \quad -2904$

$\cos A = \frac{-2625}{-2904}$

$A = \cos^{-1}(\ \nearrow\ )$

$A = 25.3°$

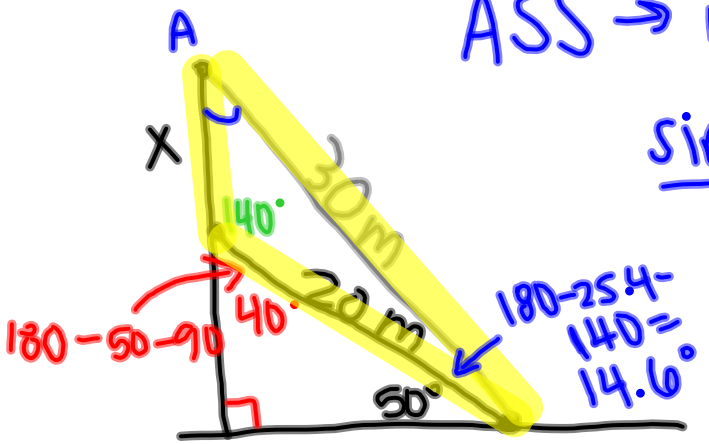
$A + B = 180$

$A + B + C = 180$

6.6 Applications

EQ: How do I solve word problems with oblique triangles?

2. A guy wire bracing a transmission tower is 20 meters long and makes an angle of 50° with the ground. It is to be replaced by a 30 meter wire starting from the same point on the ground. How much farther up the tower will the new wire reach? {nearest tenth}



ASS → inverse law of sines

$$\frac{\sin 140}{30} = \frac{\sin A}{20}$$

$$\frac{20\sin 140}{30} = \sin A$$

$A = \sin^{-1}(\quad)$

$A = 25.4°$

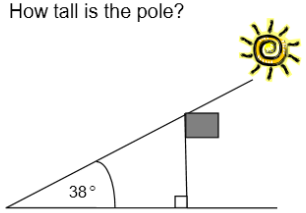
$$\frac{\sin 14.6}{x} = \frac{\sin 140}{30}$$

$x = 11.7$ m

6.6 Oblique Triangle Applications Name _____

Draw a picture. Set up the problem using the Law of Sines, the Law of Cosines, or right triangle trigonometry, and solve. Show all work. Round all answers to the nearest hundredth.

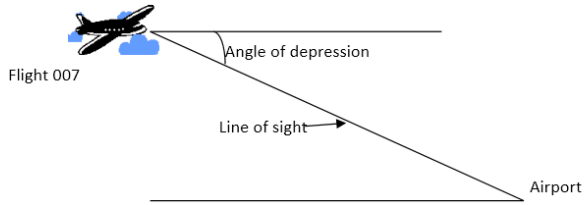
1. *Flagpole Problem:* Calvin Butterball is waiting outside the school building for his trigonometry test to begin. He observes that the flag-pole is casting a shadow on the ground and decides to calculate how high the pole is. He steps off the shadow, finding it to be 22 meters long. From an almanac, he finds that the Sun's angle of elevation is 38°. How tall is the pole?



2. *Airplane Problem:* Aloha Airlines Flight 007 is approaching Kahului Airport at an altitude of 5 kilometers. The angle of depression from the plane to the airport is 9°32'.

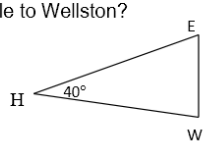
   a) What is the plane's ground distance from the airport?

   b) If the plane descends directly along the line of sight, how far will it travel along this line in reaching the airport?

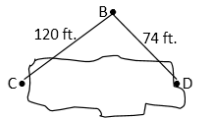


3. A surveyor marks points A and B 200 meters apart on one bank of a river. She sights a point C on the opposite bank and determines <A = 57° and <B = 42°. What is the distance from A to C?

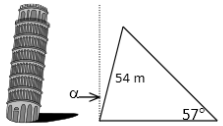
4. Two straight roads meet an angle of 40° in Harville, one leading to Eastview and the other to Wellston. Eastview is 18 miles from Harville and 20 miles from Wellston. What is the distance from Harville to Wellston?



5. An engineer wants to measure the width of a sinkhole. He places a stake at B as shown and measures from the stake to C and D as shown. If the angle at B is 103°, how wide is the sinkhole?



6. A visitor to the Leaning Tower of Pisa observed that the tower's shadow was 40 meters long and the angle of elevation from the tip of the shadow to the top of the tower was 57°. The tower is now 54 meters tall (measured from the ground to the top along the center line of the tower). Approximate the angle α that the center line of the tower makes with the vertical line.



7. A plane flying in a straight line passes directly over point A on the ground and later directly over point B, which is 3 miles from A. A few minutes after the plane passes over B, the angle of elevation from A to the plane is 43° and the angle of elevation from B to the plane is 67°. How high is the plane at that moment?

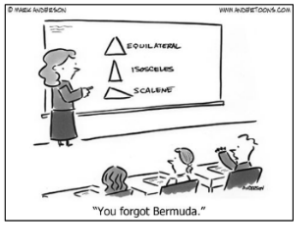
8. The pilot of a commercial airplane finds it necessary to detour around a group of thunderstorms, as shown. He turns the plane at an angle of 21° to his original path, flies 100 km, turns, and then rejoins his original path 70 km from where he left it.

a) How much further did he have to fly because of the detour?

b) At what angle did he rejoin his original course?

Oblique Triangles Story Project

Oblique triangles are everywhere! Your job is to create a story that includes 5 oblique triangle word problems within it. You will need a visual product for your story. This can be an actual book, something digital, a video, etc. You will read your story to the class on **Friday, January 26.**



You will need to solve your problems separately and show all work. Label each problem by the type of triangle it is. You will need one problem for each of the triangles listed below. Please label what type of question each of your problems represents. Remember, these should be oblique triangles, so the given angle should not be 90°

1. Given SAS, solve for the 3rd side
2. Given SSS, solve for an angle
3. TWO: Given SSA, AAS, or ASA, solve for a side, solve for a side or angle (be careful of the ambiguous case!)
4. Given any information, solve for the area of the triangle (or another shape made up of triangles)

This project will count as a TEST grade and is due at the beginning of class Friday, January 26. If your project is digital, use the google classroom assignment to submit a link or presentation.

Name: _____ Period: _____

Description	***0 points***	***1 point*** *For each problem*	***3 points*** *For each problem*	***5 points*** *For each problem*	***Points earned***
Did you set up and solve the problem correctly?	No equation provided.	Equation has several errors in the set up or solution.	Equation has one error in the set up or solution.	Equation is set up and solved correctly.	/25
Does the problem make sense and fit into the story?	No problem provided.	Problem has several elements that do not make sense or does not fit into the story.	Problem has some elements that do not make sense.	Problem makes complete sense and fits in well.	/25
Description	***0 points***	***10 points***	***20 points***	***30 points***	***Points earned***
How visually pleasing is your story?	No visual provided.	Includes little detail, pictures and/or color, indicating a minimal amount of time and effort.	Includes some detail, pictures and/or color, indicating a moderate amount of time and effort.	Includes intricate detail, pictures and/or color, indicating a large amount of time and effort.	/30
Description	***0 points***	***3 points***	***5 points***	***10 points***	***Points earned***
Is your story creative?	Story is copied or unoriginal	Story does not contain details and is very generic	Story contains a few creative details or a creative theme that contributes to the reader's enjoyment	Story has many creative details that contribute to the reader's enjoyment. The student has really used their imagination	/10
Is your story turned in on time?	Story is not ready at the beginning of class ~~12/6~~		Story is ready at the end of class ~~12/6~~	Story is ready at the beginning of class ~~12/6~~	/10

6.6 Applications

Tomorrow and Monday are ~~work~~ days.

- Any unit 6 assignment. Calendar is due (6 total stamps) on TUESDAY.
- Your project (you may work with ONE partner)
- Unit 6 Extra Credit (look on google classroom - it's an online assignment on the pearson website again)

Please be productive!!