Unit 13 Right Triangle Trigonometry

Guided Notes

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name

\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period

\*\*If found, please return to Mrs. Brandley’s room, M-8.\*\*

**Self-Assessment**

The following are the concepts you should know by the end of Unit 1. Periodically throughout the unit I will ask you to self-assess on how you are doing on these skills. It is essential for you to be able to identify what you do and do not understand in order to learn effectively. You will use the following scale:

5: Yes! I understand

4: I’m almost there.

3: I am back and forth.

2: I am just starting to understand.

1: I don’t understand at all.

**Concept 1: Trig Ratios**

\_\_\_\_\_ I know that sine is the opposite over hypotenuse.

\_\_\_\_\_ I know that cosine is the adjacent over hypotenuse.

\_\_\_\_\_ I know that tangent is the opposite over adjacent.

\_\_\_\_\_ I can find the sin, cos, tan and their inverses of a given angle using a calculator.

**Concept 2: Trig Ratios-Find Missing Piece**

\_\_\_\_\_I can use properties of sine, cosine, and tangent to solve for missing side lengths in a right triangle.

\_\_\_\_\_I can use properties of sine, cosine, and tangent to solve for missing angles in a right triangle.

**Concept 3: Complementary Angles**

\_\_\_\_\_ I know that complementary angles are two angles that add to 90 degrees.

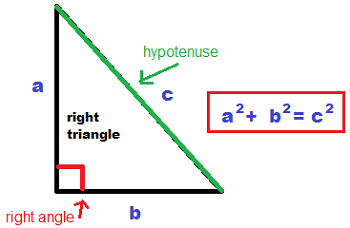
\_\_\_\_\_ Given the fraction value for one trig function, I can find the other two.

\_\_\_\_\_ I know that sine and cosine are cofunctions and given one I can find the other.

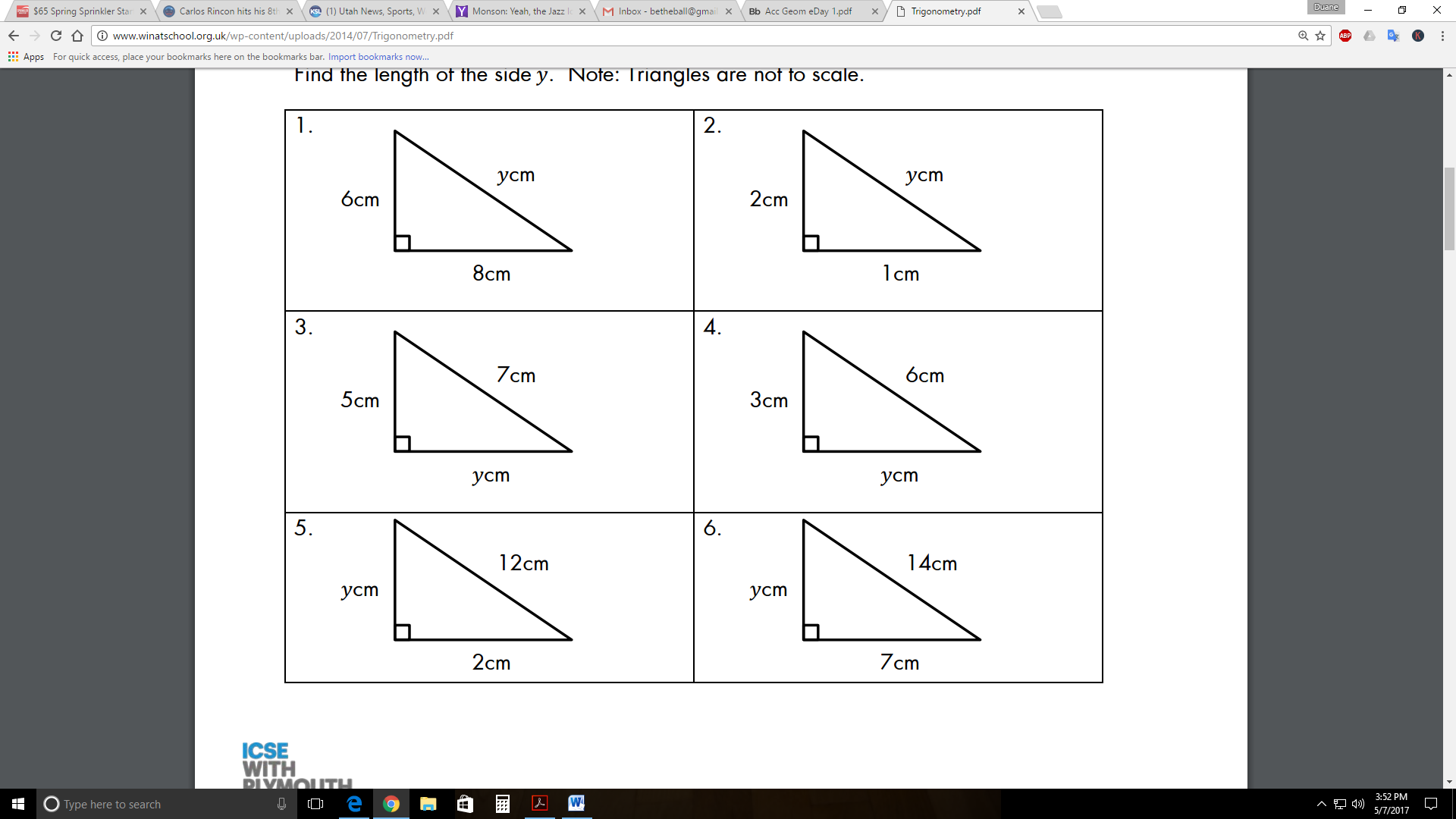
**Concept 4: Trig Story Problems**

\_\_\_\_\_ I can use what I know about sine, cosine, and tangent to solve story problems.

**REVIEW-PYTHAGOREAN THEOREM**



Use the Pythagorean theorem to find the missing side length. (y)



**Concept 1: Trig Ratios**

SOH -CAH -TOA

For exercises 1-6, refer to *∆ABC*.

Find each of the following in fraction form.

15

8

1. Sin A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Sin B \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Cos A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Cos B \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Tan A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Tan B ­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C

A

B

17

Use a calculator for exercises 7-12. Round your answers to 3 decimal places.

7. sin 26° \_\_\_\_\_\_ 8. cos 53° \_\_\_\_\_\_ 9. cos 34° \_\_\_\_\_\_

10. sin 12° \_\_\_\_\_\_ 11. tan 12° \_\_\_\_\_\_ 12. tan 21° \_\_\_\_\_\_

*An inverse sine, cosine, or tangent “Undoes” the sine, cosine, or tangent, allowing us to solve for more variables.*

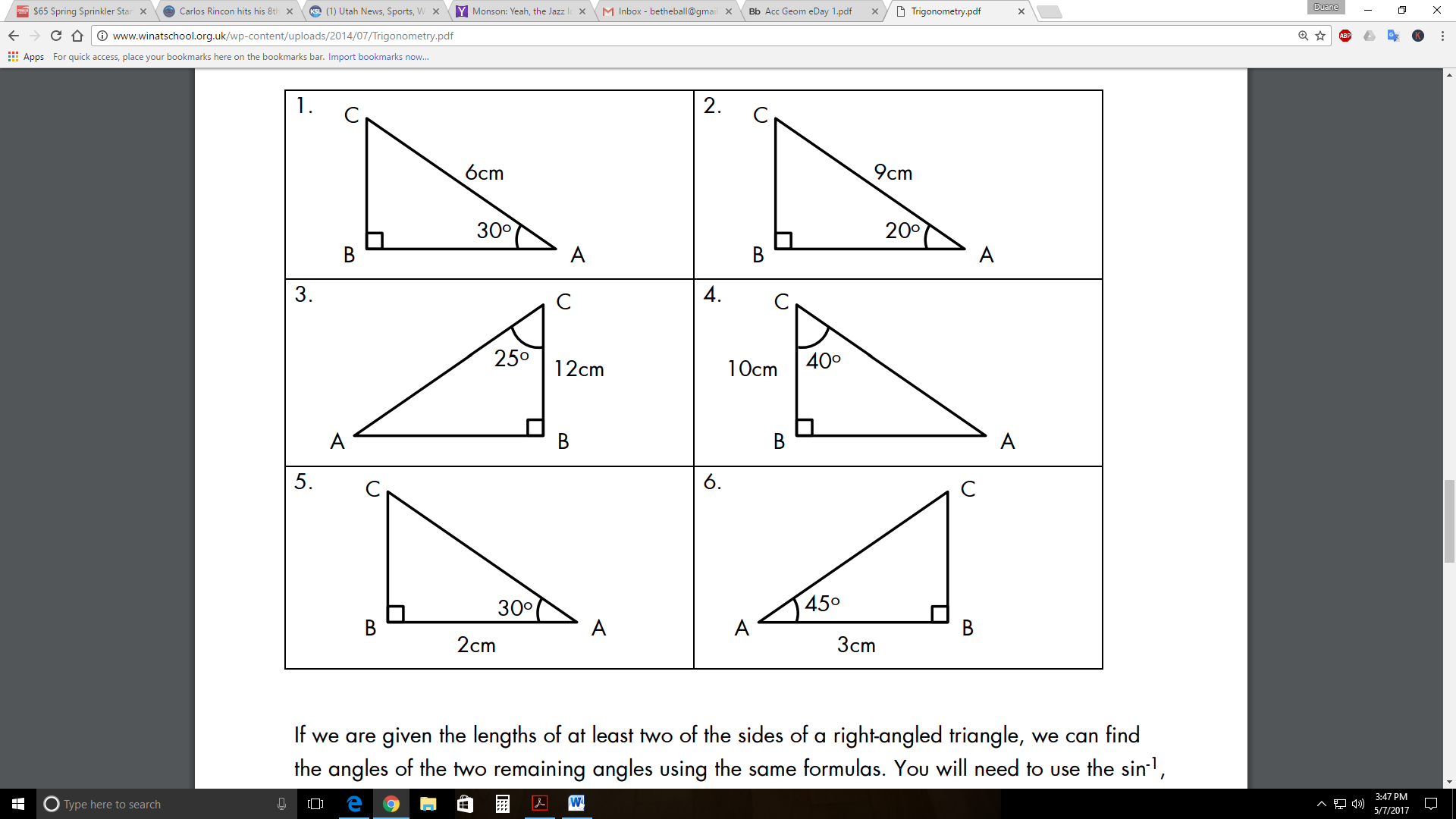
Use a calculator for exercises 16-33. Round your answers to 3 decimal places.

13. \_\_\_\_\_\_ 14. \_\_\_\_\_\_ 15. \_\_\_\_\_\_

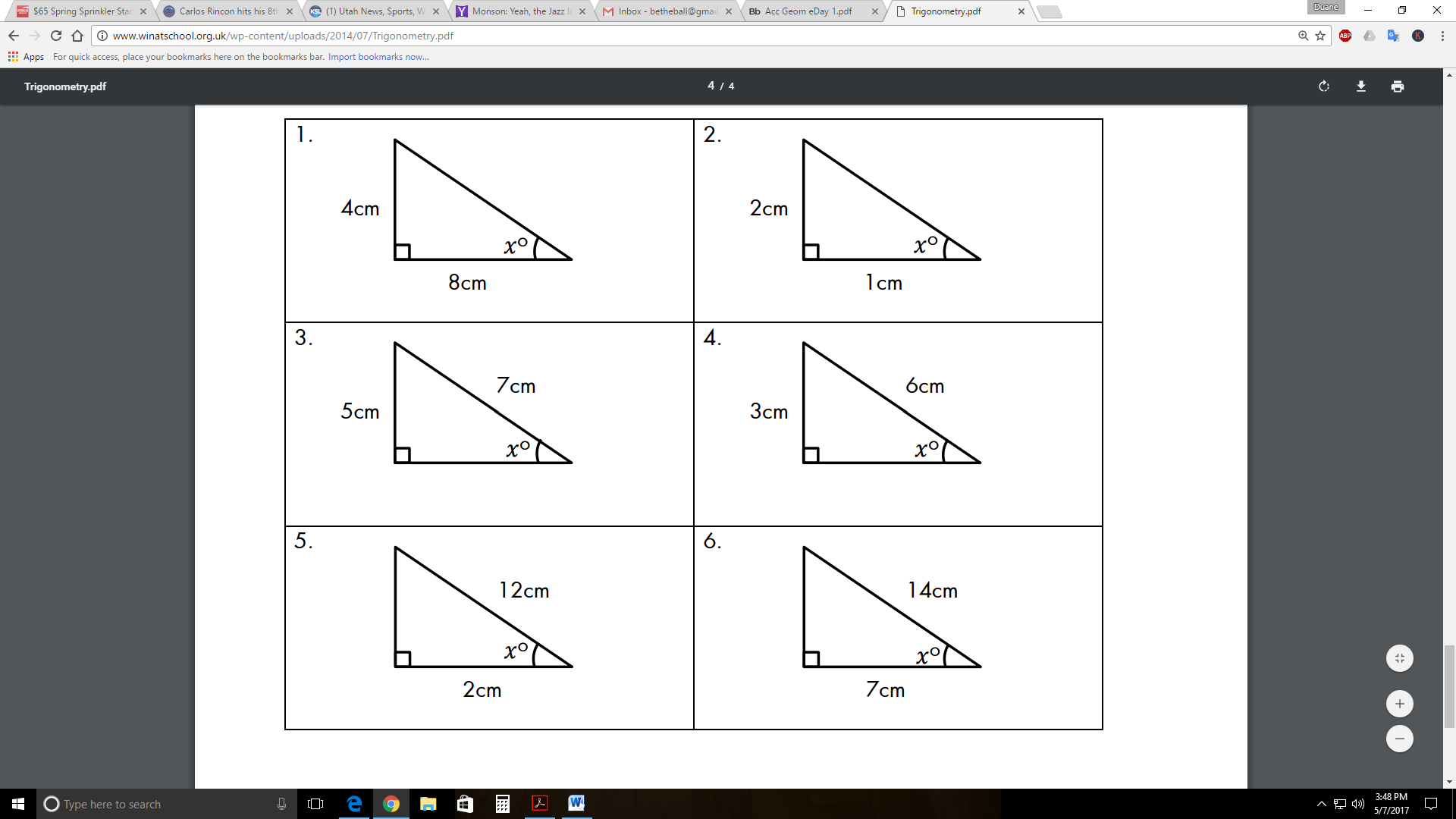
16. \_\_\_\_\_\_ 17. \_\_\_\_\_\_ 18. \_\_\_\_\_\_

**Concept 2: Trig Ratios-Solving for Missing Piece**

Find the remaining two side lengths using sine, cosine, and tangent



Find the missing angle x.



Find each angle measure to the nearest degree.

5. 6. 7.

8. 9. 10.

**Concept 3 Complementary Angles**

1. If , what is the 2. If , what is the

3. If , what is the 4. If , what is the

Complementary Angles: Two angles that add to 90 degrees. The two acute angles in a right triangle are complementary since all three angles must add up to 180 degrees.

Sine and Cosine are what is called “cofunctions” which means that the sine of one angle is equal to the cosine of that angle’s complement and vice versa.

EXAMPLE: sin(30)=cos(60) or cos(42)=sin(48)

Rewrite each equation using complements and the other trig function.

5. 6. 7.

8. 9. sin 13o = \_\_\_\_\_ 10. sin xo = \_\_\_\_\_

**Concept 4: Trig Story Problems**

**For each of the following, draw a picture and then solve for the missing variable.**

1. According to the Americans With Disabilities Act, a ramp can rise no more than 1 ft. for every 12 ft. of horizontal distance. What is the maximum angle that the ramp can form with the ground?

2. To guard against fall, a ladder should make an angle of 75º or less with the ground. What is the maximum height that a 20 foot ladder can reach safely?

3. Mr. Boone is building a wooden ramp to allow people who use wheelchairs easier access to the public library. The ramp must be 2 ft tall. Find the angle of elevation if the ramp begins 24 ft away from the library.

4. A forest ranger sights a tree through a surveying instrument. The angle of elevation to the top of the tree is 27º. The surveyor is 100 feet from the base of the tree. How tall is the tree?

5. A train travels 5000 meters along a track whose angle of elevation has a measurement of 3º. How much did the train rise during this distance.

6. The heights of several tourist attractions are given in below. Find the angle of elevation from a point 100 feet from the base of each attraction to its top.

a. Gateway to the West Arch, St. Louis 1368 ft.

b. Chief Crazy Horse Statue, South Dakota 563 ft.

c. Washington Monument, Washington, D.C. 555 ft.

d. Statue of Liberty, New York City 305 ft.