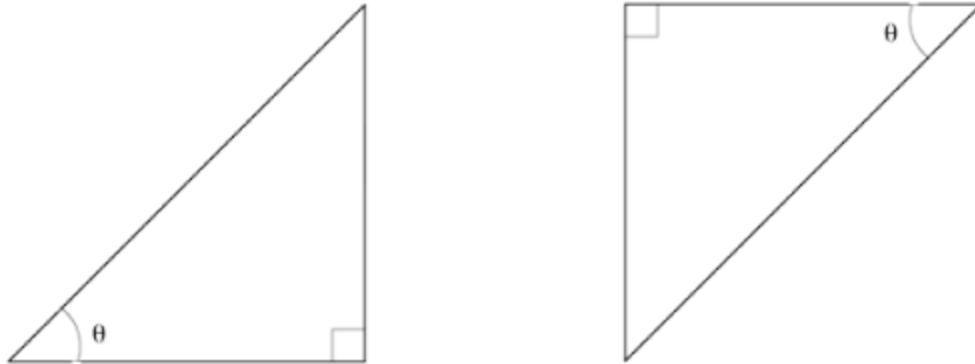


Trigonometry Lesson 1: Introduction to Trigonometry
Includes material from textbook sections 7.2 and 7.8

1. What is trigonometry (and why are right triangles so important)?

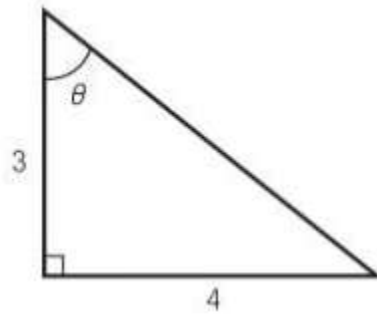
2. Label the sides of the following right triangles with their names relative to the angle θ (textbook pg. 452):



3. What are all the possible ratios of these sides of a right triangle (textbook pg. 453)?¹

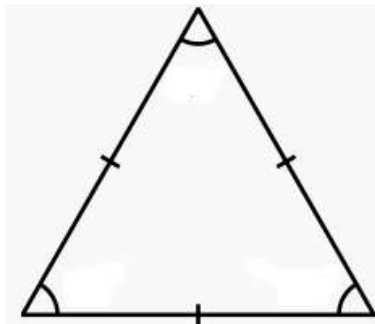
¹ Exclude cases in which a side is divided by itself.

4. Find the values of the six trigonometric functions for the angle θ in the following triangle (textbook pg. 454):



Note: 3, 4, and 5 are called a *Pythagorean triple* (these can be very useful). Can you think of any more?

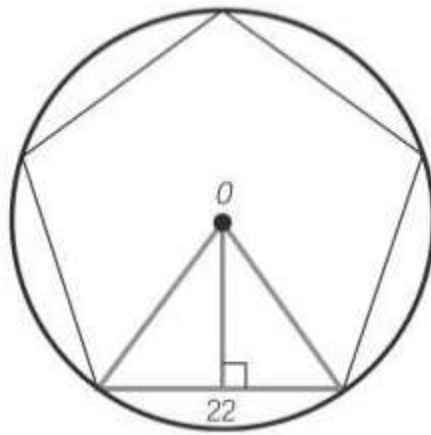
5. Use an equilateral triangle of side length 1 to derive the values for the sine and cosine of 30° and 60° (for a similar approach using an equilateral triangle of side length 2, see textbook pg. 456-457). Use these values to find the tangent of these angles.



What is the largest value that sine and cosine can take? Why?

6. Using a similar method, derive the values for the sine, cosine, and tangent of 45° (textbook pg. 455).

7. The side of a regular pentagon is 22. Find the radius of the circle circumscribed about that pentagon.
Challenge: Use this to find the area of the pentagon. (This problem requires a calculator.)



8. *Application:* In an attempt to estimate the height of a building, you walk 100 feet away from the base of that building and determine that your angle of elevation to the top is 45 degrees. How tall is the building?

Homework Assignment: Section 7.2: 1-11 odd, 15, 17
Section 7.8: 5, 7, 13 (the pentagon problem)