

**Section 6.2 Learning Objectives:**

- Video 1: The Graphs of Tangent and Cotangent (8:06)
  - State the coordinates of the key features of the tangent and cotangent functions.
  - Understand the relationship between the graphs of the sine and cosine functions and the tangent and cotangent functions.
- Video 2: The Graphs of Secant and Cosecant (4:51)
  - State the coordinates of the key features of the secant and cosecant functions.
  - Understand the relationship between the graphs of the sine and cosine functions and the secant and cosecant functions.
- Video 3: The Graphs of Transformed Trigonometric Functions (11:35)
  - Graph a transformed trigonometric function given an equation.
- Video 4: The Negative Angle Identities (3:02)
  - State the negative angle identities for the tangent, cotangent, secant, and cosecant functions.
  - Understand the relationship between the negative angle identities of the sine and cosine functions and the other trigonometric functions.

**Individual Learning Objective Binder Check:** Before class, you should have completed the Learning Objective Worksheet for each of the learning objectives in the video. These should have been placed in a binder in an organized manner so that it can be quickly checked by the instructor. If you have specific questions, this is a good time to ask the professor about them. While you are waiting for the professor to make their way around the room, you can work on the rest of the activities.

**Group Practice Problems:** In a group of no more than 3 students, work on the following problems. While everyone in the group should work together, each student should write out their work for themselves. This work can prove to be helpful when working on the homework assignment. If questions arise as you're working on these problems, feel free to seek help from the instructor or other groups of students.

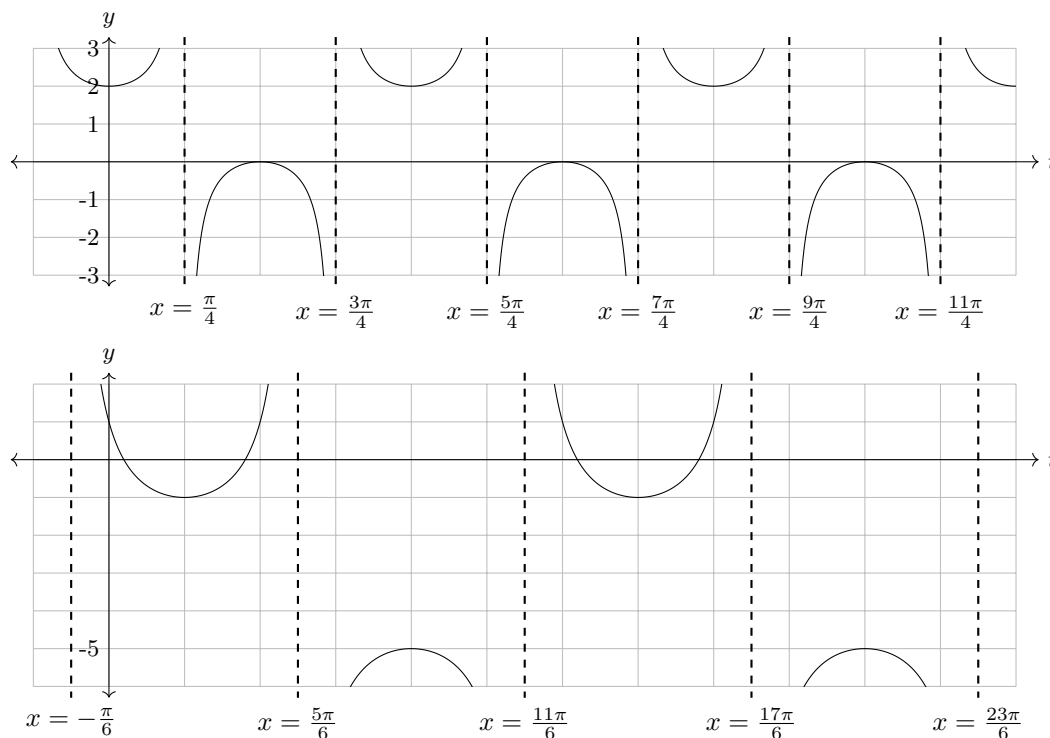
*Group Practice Problems #1 - The Tangent and Cotangent Graphs:* Starting with the graph of the tangent function, use the fact that  $\cot(\theta) = \frac{1}{\tan(\theta)}$  to graph the cotangent function. Be sure to explain the relationships between the zeros and the vertical asymptotes.

*Group Practice Problems #2 - The Secant and Cosecant Graphs:* Recall the cofunction identity  $\sin\left(\frac{\pi}{2} - \theta\right) = \cos(\theta)$ . (Do you remember why this is true?) Use this to prove that  $\csc\left(\frac{\pi}{2} - \theta\right) = \sec(\theta)$ . Using this equation and the transformation of graphs, determine the graph of the secant function starting from the graph of the cosecant function. (Hint: You will want to rearrange the terms inside the argument of the cosecant function so that it fits the pattern we used in the previous section.)

*Group Practice Problems #3 - Graphing Trigonometric Functions:* Graph at least two periods of the following functions. Be sure that the vertical asymptotes are clearly identified and labeled, and indicate the midlines.

- $y = \tan(2t) + 1$
- $y = 2 \sec\left(2\left(t - \frac{\pi}{2}\right)\right) - 4$
- $y = -3 \cot(\pi(t + 2)) + 2$

*Group Practice Problems #4 - Determining the Equations of Graphs:* Determine two equations for each of the graphs. One of the equations should be a secant function and the other should be a cosecant function. (Hint: You may find it helpful to graph the underlying sinusoidal function.)



*Group Practice Problems #5 - Negative Angle Identities:* Simplify the expressions.

- $\tan(-\theta) \cos(\theta)$
- $\sqrt{1 - \sin(-\theta)^2}$

**Group Work Check:** Present your work for the practice problems to the instructor for approval. The work will not be graded deeply, but simply graded on whether it appears that you have put in a good faith effort to do the work. If you are not confident about particular problems, this is a good time to ask about them.

### Section 6.2 Homework:

- 6.2 (General Problems): #1, 3, 7, 9, 11, 13, 17, 19, 21, 23
- 6.2 (Write-Up): #27, 28