Section 6.4 Learning Objectives:

- Video 1: Graphs and Solutions (5:15)
  - Understand the connection between the graphs of trigonometric functions and solutions of trigonometric equations.
  - Understand the connection between the unit circle and solutions of trigonometric equations.
- Video 2: Exact Solutions (7:58)
  - Determine the exact solutions of basic trigonometric equations in both degrees and radians when working with known unit circle values.
- Video 3: Approximate Solutions (8:00)
  - Determine the approximate solutions of basic trigonometric equations in both degrees and radians when working with general values.
- Video 4: Solving More Complex Equations (9:24)
  - Determine the solutions of linear trigonometric equations in which the argument has an arbitrary coefficient.

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 - Solving by Graphing: Use Desmos or a graphing calculator to approximate the first four positive and first two negative solutions of equation by graphing.

- $\sin(t) = \frac{2}{3}$
- $\cos(t) = -\frac{3}{4}$

Group Practice Problems #2 - Exact Solutions on the Real Line: Determine the exact solutions (in radians) of the equation. Draw a unit circle diagram and indicate the quadrants in which the solutions lie, and identify the reference angle.

- $\sin(t) = -\frac{\sqrt{3}}{2}$
- $\cos(t) = \frac{1}{2}$

Group Practice Problems #3 - Exact Solutions on an Interval: Determine the exact solutions (in degrees) of the equation on the interval $[0, 360^\circ)$. Draw a unit circle diagram and indicate the quadrants in which the solutions lie, and identify the reference angle.

- $\sin(t) = -\frac{\sqrt{2}}{2}$

- $\cos(t) = 0$

Group Practice Problems #4 - Approximate Solutions on the Real Line: Determine the approximate solutions (in degrees) of the equation. Draw a unit circle diagram and indicate the quadrants in which the solutions lie, and identify the reference angle.

- $\sin(t) = -0.7$
- $\cos(t) = 0.4$

Group Practice Problems #5 - Approximate Solutions on the an Interval: Determine the approximate solutions (in radians) of the equation on the interval $[0, 2\pi)$. Draw a unit circle diagram and indicate the quadrants in which the solutions lie, and identify the reference angle.

- $\sin(t) = 0.1$
- $\cos(t) = -0.8$

Group Practice Problems #6 - Solving Linear Trigonometric Equations: Determine the solutions (in radians) of the equation.

- $3\sin(2t) + 1 = -1$
- $4\cos(3t) - 1 = -\cos(3t) + 1$

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 6.4 Homework:

- 6.4 (General Problems): #1, 5, 9, 13, 17, 21, 25, 29
- 6.4 (Write-Up): #33 (in degrees), 37 (in radians)