Advanced Mathematics Name_____

Date____

Period____ **Chapter 1 Review Part I (No Calculator Allowed)**

A solution guide is posted on my website. Several problems have multiple solution methods but the solution guide shows only one correct solution method per problem. Alternative methods that are mathematically valid and show steps discussed in class and previous assignments are acceptable on the review/quiz.

There are more questions on the review than the Test. For example, you will solve a few trigonometric equations (Review 10) but not all trig functions on the test. I put all types on the review so you are prepared to solve whichever type is on the test.

There will be few Level II questions on the test. You can review your assignments and previous quizzes from this chapter to get an idea of potential Level II questions.

All of the problems on Part I should be completed without a calculator.

1. Given $f(x) = 3cos\left[\frac{\pi}{4}(x + 1)\right] - 2$

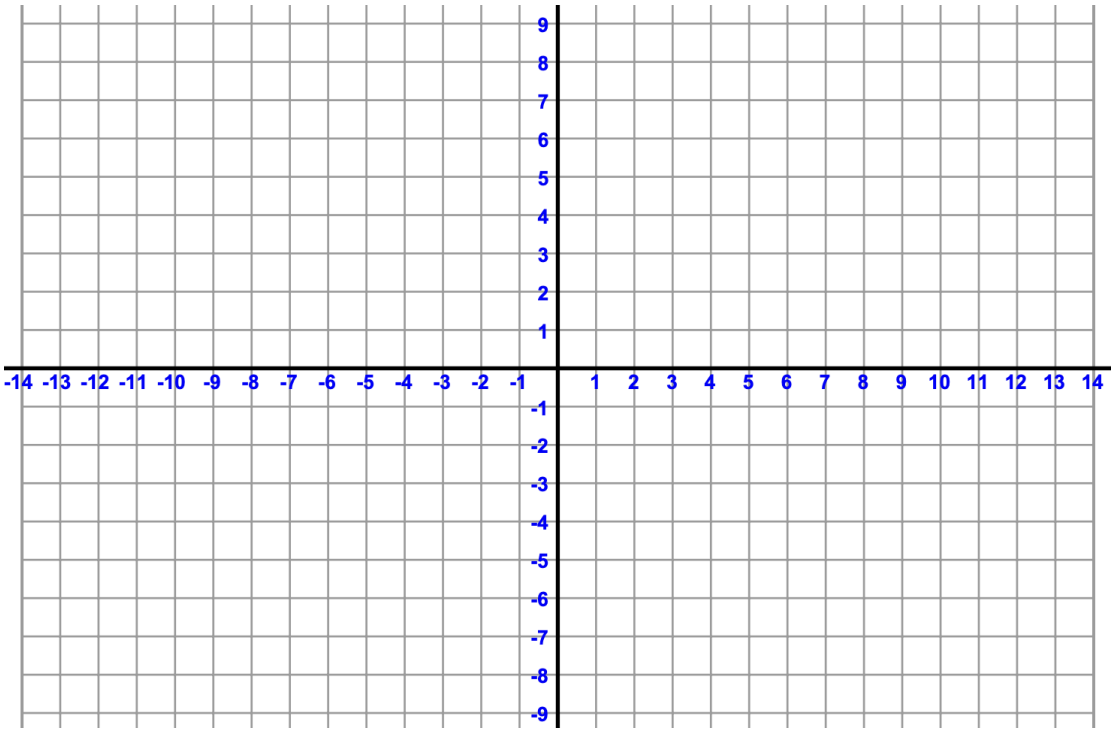
A. What is the vertical displacement?

B. What is the amplitude?

C. What is the period?

D. What is the phase shift?

E. Sketch the graph. (Sketch at least two complete periods.)



F. Explain how you could use the graph of $f(x) = 3cos\left[\frac{\pi}{4}(x + 1)\right] - 2$ to solve $3cos\left[\frac{\pi}{4}(x + 1)\right] - 2 = -1$.

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Period____ **Chapter 1 Review Part II (Calculator Allowed)**

You may use your calculator on Part II of the review. Be sure to show your steps.

2. Convert 80° to radians. Write your answer in lowest terms using pi. (Either show your work or explain the reasoning behind your method.)

3. Convert 130° to radians. Write your answer in lowest terms using pi. (Either show your work or explain the reasoning behind your method.)

4. Convert 3 (radians) to degrees. Round your answer to 4 decimal places (ten-thousandths).
(Either show your work or explain the reasoning behind your method.)

5. Convert 10 (radians) to degrees. Round your answer to 4 decimal places (ten-thousandths).
(Either show your work or explain the reasoning behind your method.)

6. Given that $cos\ x\ =\ \frac{12}{13}$, find all possible values of **sin x**. Show your steps since there are several valid solution methods.

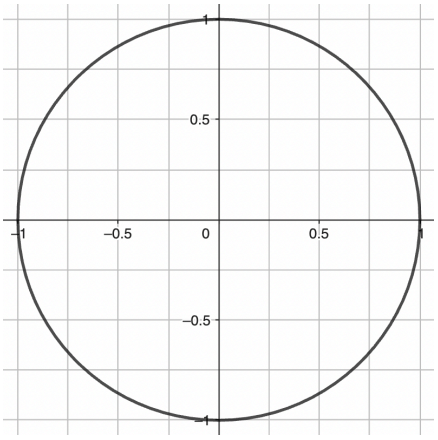
7. Given $sin\ x\ =\ -\frac{5}{13}$, find all possible values of **cos x**. Show your steps since there are several valid solution methods.

8. Given $sin\ x\ =\ \frac{8}{17}$, find all possible values of **cos x**. Show your steps since there are several valid solution methods.

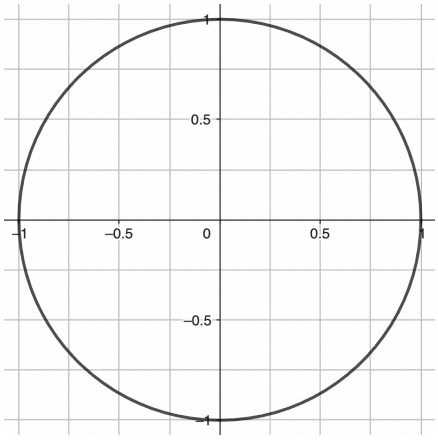
9. Show solutions on a unit circle.

- **Sketch the location of all possible solutions on the unit circle provided.**
- Each grid line represents ¼ unit.
- Use a straightedge to accurately draw the lines.

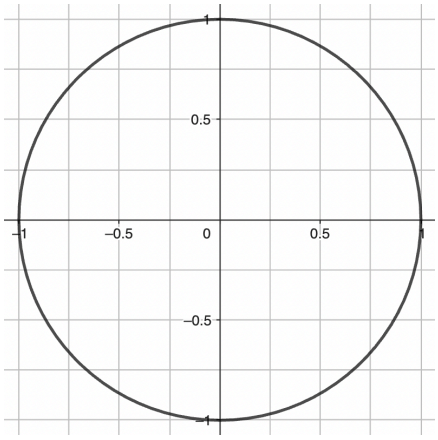
A. $\sin\theta = -.5$



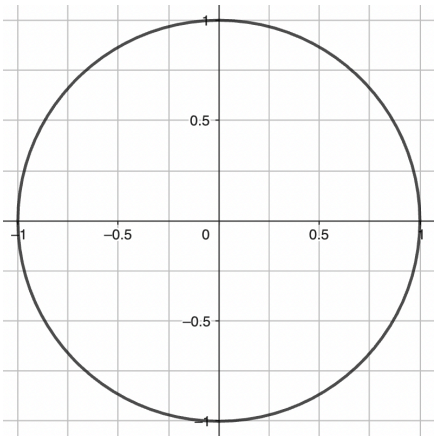
B. $\cos\theta = .5$



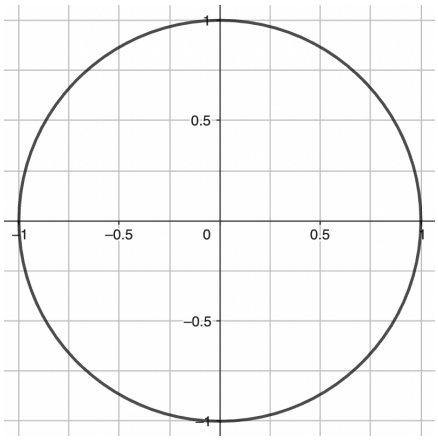
C. $\tan\theta = -\frac{1}{3}$



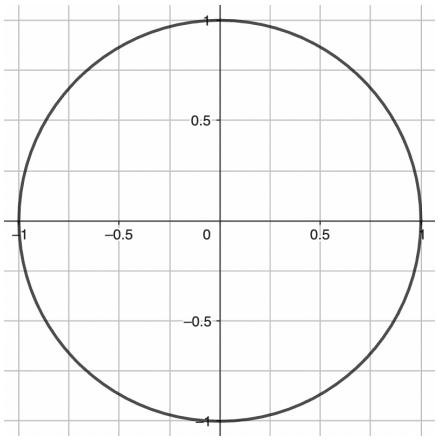
D. $\sin\theta = .5$



E. $\cos\theta = -.5$



F. $\tan\theta = 3$



10. Solve each equation.

- **Round answers to 4 decimal places.**
- **Be sure to find all solutions by writing your solution in general form.**
- **Show your steps.**
- **If an equation does not have a solution, explain why the equation has no solutions.**
- **You should be in radian mode.**
- You may use a graph to check your answers but the graphs alone do not count as steps. Answers without supporting work will not receive full credit.

A. $sec\, x = -3$

B. $csc\, x = 8$

C. $4tan\, x + 1 = 17$

D. $7sin\, x - 1 = 4$

E. $7cos\, 3x - 1 = 4$

F. $7sin\, x = 28$

11. The distance a pendulum is from a sensor at t seconds forms a sinusoidal function.
Use the data below collected from a pendulum to answer the questions below. The data is also shown in the graph.

	Min 1	Max 1	Min 2	Max 2	Min 3	Max 3
Time (sec)	.4	2.0	3.6	5.2	6.8	8.4
Distance (ft)	2	9	2	9	2	9

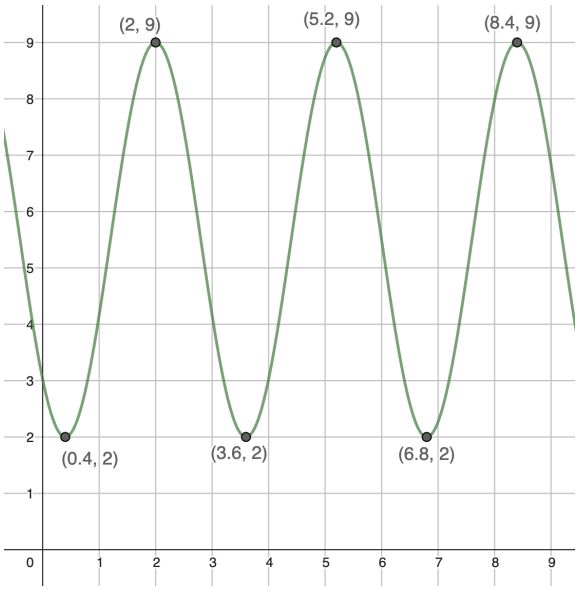
A. Identify each of the following.

Amplitude =

Vertical Displacement =

Period =

Phase Shift for Cosine =



B. Write a cosine function, f(t) that represents the distance in feet the pendulum is from the sensor t seconds after data collection begins.

C. Write a sine function that would also model the data. **Explain your reasoning** behind how you adjusted your cosine function to become a matching sine function in complete sentences.

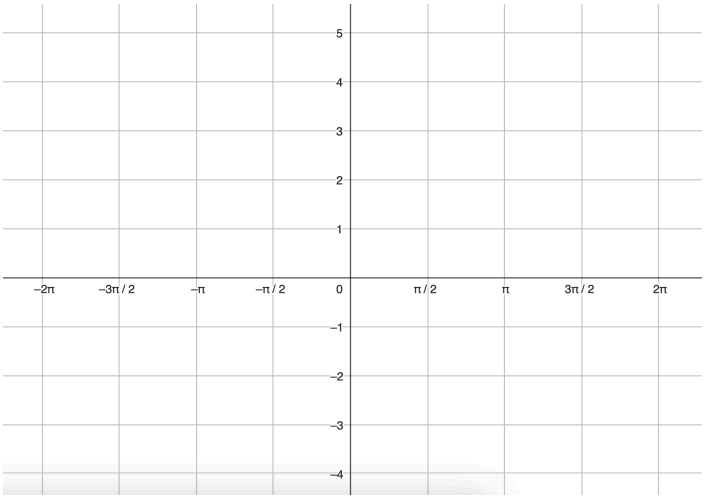
12. The center of a Ferris wheel is 30 feet above the ground and its highest point is 55 feet above the ground. The Ferris wheel takes 5 minutes to make a complete revolution.

a. Write a cosine function H(t) that represents the height of a person of the Ferris wheel *t* minutes after reaching the highest point of the wheel. Sketching a graph may help to write the function.

b. Write a sine function that would also match the graph in parts a. Explain your reasoning, specifically the part of the function that changed to go from a cosine function to a sine function.

13. Sketch the graph of each function. Then state the domain and range.

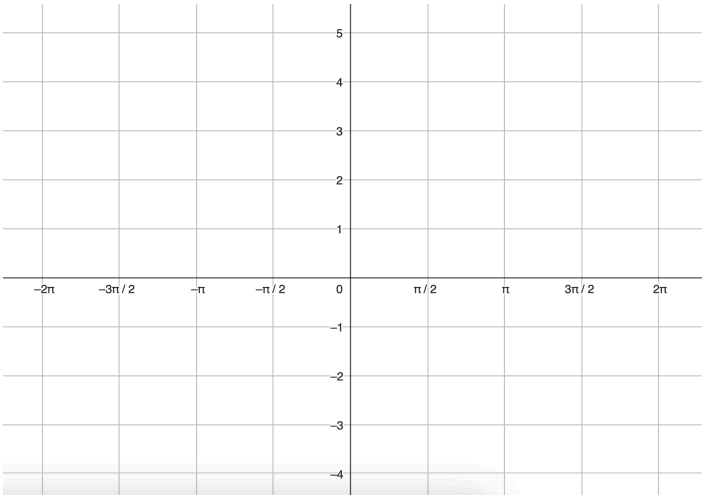
A. $f(x) = tan\, x$



Domain:

Range:

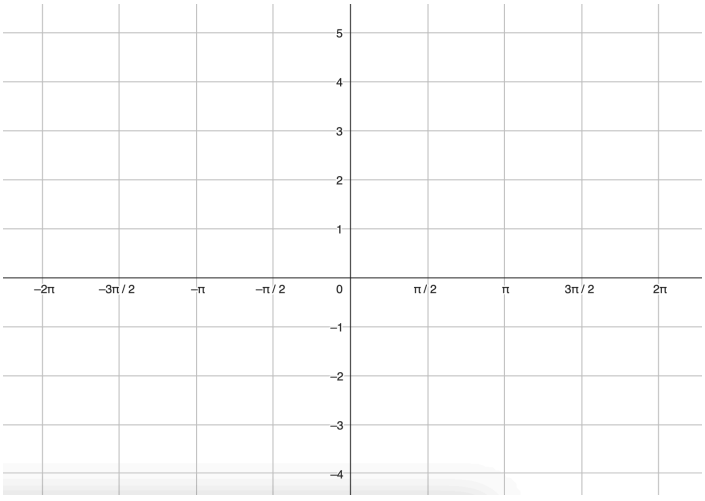
B. $f(x) = sec\, x$



Domain:

Range:

C. $f(x) = csc\, x$



Domain:

Range:

14. You should also be prepared to find exact trigonometric values with unit circle knowledge. You completed several tables where you found exact trig values with your unit circle knowledge on activities and assignments throughout the chapter.