Student Teacher: Christina Bifulco
Class: Pre-Calculus
Date: Thursday, February 28, 2008

Topic:

Graphing Sine and Cosine Using With Varying Period and Amplitude

New Jersey Core Curriculum Standards:

4.3.12.B. Functions and Relationships, Grade 12

- Analyze and explain the general properties and behavior of functions of one variable, using appropriate graphing techniques

4.5.E. Representations, Grade 2-12

- Create and use representations to organize, record, and communicate mathematical ideas.

Objectives:

1. Students will be able to determine types of vertical and horizontal shrinking based on the equation for a function.
2. Students will be able to graph sine and cosine functions, taking into account different types of vertical and horizontal shrinking.

Materials:

- Blackboard and chalk
- Overhead projector
- Overheads

Motivation:

Graph sin x and sin 2x on the same coordinate axis.

Procedure:

1. Go over homework from previous night.
2. Go over do-now problem.
    i. How are the graphs the same and how are they different?
    ii. How does the period affect the graphs? How does it affect the number of cycles of a function?
3. Students will be placed in pre-assigned groups. The groups are 4-5 peoples with one higher level student, 2-3 middle level students and one lower level student. The groups will be responsible for completing worksheet of graphing various sine and cosine functions (cycles problems on back of problems will be completed at a later

time). Each group will be given one problem from the worksheet (one of the graphing problems) in which they will have to complete and then present to the class. Groups will be responsible for completing the first eight problems, with each group having one problem that they will be responsible for presenting.

4. Each group will present the solution and graph of their problem to the class for their peers to check their answers to the problem. Students and teacher will have the chance to ask questions.
    i. What is the difference between this graph and the previous graph?
    ii. How did you decide if the graph is typical or image?
    iii. How did you decide to scale the graph?

Assessments:

Students will complete problems on worksheet in groups and present to class.

Homework:

Finish the remaining problems of the sheet.

Name_____ Date_____ Period_____

Graphs of Sine and Cosine Functions Worksheet 1
Pre-Calculus

Directions: For each of the following functions complete the chart. Graph problems 1-8.

Function	Amplitude	Period	Zeros	Maximum Point	Minimum Point
1. $y = 2\sin\frac{1}{2}x$					
2. $y = \frac{1}{3}\cos 2x$					
3. $y = -3\sin x$					
4. $y = \cos 4x$					
5. $y = 2\cos x$					
6. $y = \frac{-1}{2}\sin 4x$					
7. $y = \frac{-2}{3}\cos 3x$					
8. $y = \frac{3}{2}\sin 2x$					
9. $y = 6\cos x$					
10. $y = -2\cos .5x$					
11. $y = \cos\frac{x}{3}$					
12. $y = \sin\frac{3x}{2}$					
13. $y = -4\sin\frac{x}{2}$					
14. $y = \frac{3}{4}\cos\frac{3x}{4}$					

For problems 15-24, use the function y = sin x. Determine the endpoint of the interval for the indicated number of cycles.

15. 4 cycles [-4π, _____]

16. 1 ½ cycles [3π, _____]

17. 2 ¾ cycles [0π, _____]

18. 1 cycle $[\frac{-\pi}{3}, \_\_\_\_\_]$

19. ½ cycle [-5π, _____]

20. 5 cycles $[\frac{-3\pi}{2}, \_\_\_\_\_]$

Determine the number of cycles over the indicated interval.

21. $[\frac{-5\pi}{3}, \frac{8\pi}{3}]$ _____ cycles

22. $[\frac{\pi}{4}, \frac{17\pi}{6}]$ _____ cycles

23. $[\frac{-3\pi}{4}, 3\pi]$ _____ cycles

23. $[-\pi, \frac{5\pi}{2}]$ _____ cycles

For problems 25 – 30, complete the chart.

Function	Interval	Length of Interval	Period	Number of Cycles
25. $y = 4\cos 3x$	[0π, 4π]			
26. $y = -2\sin\frac{x}{3}$	[0π, 8π]			
27. $y = \frac{1}{3}\sin 2x$	[-2π, 2π]			
28. $y = -5\cos\frac{x}{2}$	$[\frac{-5\pi}{2}, \frac{\pi}{4}]$			
29. $y = \frac{-1}{2}\sin\frac{3x}{4}$	[-3π, -π]			
30. $y = \cos\frac{-4x}{3}$	$[\frac{5\pi}{2}, \frac{21\pi}{4}]$			