

The Trig Function Teacher Manual contains 154 pages of descriptions of how to use the decks in a variety of classroom settings. These three sample pages from the Lesson Enhancer section illustrate the formats for (1) Cooperative Group Learning Activities, (2) student response sheets for groups of students or the entire classroom, and (3) literacy are represented.

Black line masters appear throughout the manual for teachers to make transparencies for the overhead or for making copies for individual response sheets for students. Many of the student response sheets can also serve as assessments sheets.

Whole Class Activity

Competitive Teams: All of the *Lesson Enhancers* describe a topic **Bee**, a competition for teams, and other competitive class arrangements so that students have an opportunity to test, challenge, and encourage each other.

Walkabouts: The Walkabout activities in each of the *Lesson Enhancers* describe a method for students to actively participate in matching pairs or groups of prearranged linear patterns. Selection of the cards is more interesting to students if you put the cards in a deck and tell them to “draw a card,” or let students pick a card from a hat as you walk about the room. Some teachers prefer to have the students draw the card as they enter the room for class

Masters: The activity masters that follow the Whole Class activity descriptions are appropriate for whole classroom settings and cooperative learning activities. The masters focus on patterns within the lesson topic and include example cards from the decks.

Cooperative Learning Groups

To use these decks in cooperative learning settings, arrange the students in cooperative groups with four or five students in each group. The groups have a designated **Materials Manager, Facilitator, Scribe, and Speaker**. Other titles may be assigned if the group membership exceeds four members. **Questioner** and **Encourager** are other possible choices. The directions on the activity cards designate students to perform specific tasks for the group. Students should be allowed to take turns with the role assignments at different times.

Learning Stations

Teachers may use different options with a learning station format in the classroom. One option defines four or five different stations in the classroom and students rotate between the stations performing a task station. This option works well for one class period, for multiple class periods, or in the longer class included with block scheduling. For this option, each station features a different Pattern Array. Another option is a single station set up for a pre-defined amount of time (weekly, monthly). One student or group of students can work at the station while the rest of the class is involved in another classroom assignment. A third option uses the learning station format to have one or two practice stations for students to practice or review lesson material.

Sample Page #1

Cooperative Learning Group Activities

These activities are written for cooperative learning groups; each group has a designated **Materials Manager, Facilitator, Scribe, and Speaker**. Other titles may be assigned if the group membership exceeds 4 members. **Questioner** and **Encourager** are other possible choices. The tasks in these activities name the designated person to perform specific tasks for the group.

This format card allows teachers to copy the card distribute to student groups.

Use the Coefficient Masters I - VI as you choose with this Activity Card to vary the activity class discussions.

Materials for each group:

Activity Card

Discussion Questions

Deck of cards

Optional: calculators

Activity Card for Coefficient Influence

Deck a b c d

Materials Manager. Deal the cards to all group members.

Circle the deck(s)
you are using

All group members sort the cards into six separate groups: Graph, Amplitude, Asymptote, Equation, Point Pairs, and Period.

Facilitator: Put aside all of the cards except the Graph, Point Pair, and Equation cards. Place the Graph cards out for all group members to see.

Materials Manager. Deal the Point Pair cards to all group members.

Task: All members are to match the Point Pair cards to the Graph cards by identifying coordinates from the point pair table on the graphs. After all cards are matched, the **Materials Manager** deals the Equation cards to all group members. All group members then match the Equation cards to the Graph and Point Pair card stacks by substituting the point pair coordinates into the equation to make sure the equation stays balanced.

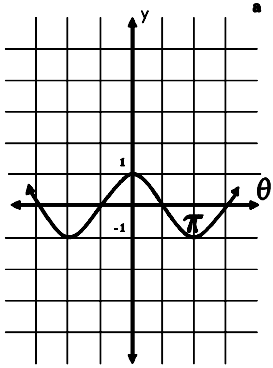
Scribe. After the task is completed, the Scribe reads the discussion questions to the group and writes the responses.

Speaker. Report the group's responses to the class.

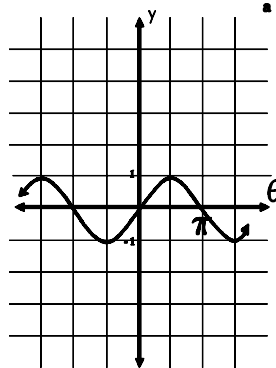
[All Cooperative Learning activity cards have a related sheet of discussion questions for the group of students to use to write their observations. The sheets also provide a strategy for groups reporting out to the whole classroom.]

Sample Page #2
Graph Identification

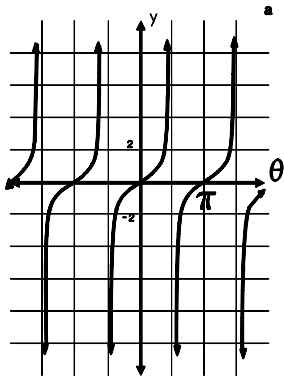
Write the name of the trig function for each graph in the blank. The coefficients = 1 for both angle and function.



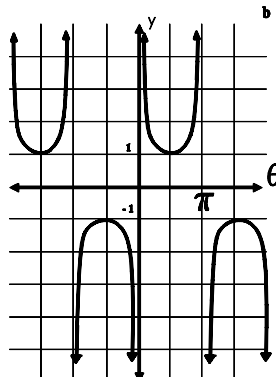
1. _____



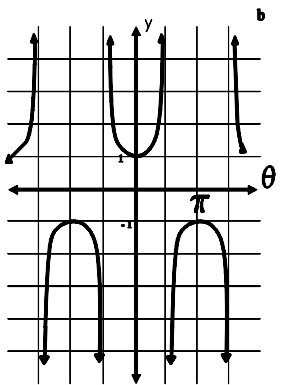
4. _____



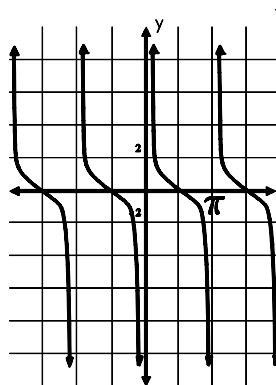
2. _____



5. _____



3. _____



6. _____

Name: _____

Date: _____

Class: _____

Period: _____

Sine Pattern Array

Step 1. Place the sine curve graphs on the first row to start your array. The order does not matter. The y axis should be labeled at the top of the Graph card.

Step 2. Match the Point Pair cards to the correct graphs.

The points in the point pair table are located on the graph. Test all of the points in order to confirm the match to the graph.

Step 3. Match the sine equations to the point pair tables for the third row of your array.

Substitute the coordinates of the points into the equation. If the points make the equation true, the equation matches the graph. Use all of the point coordinates.

Step 4. Match the Amplitude cards to the correct columns.

The amplitude describes the “slope” of the function curve. As in the linear equation, the slope is the coefficient of the trig function. The coefficient is the indicator for the amplitude.

Step 4. Use the Period cards and match to the sine functions.

The Period card will indicate the boundaries for one complete function curve up and down cycle. The rational number coefficient of the angle θ controls the period because it controls the angle Use the ratio n : period as $\frac{1}{n} : 2\pi$ when n represents the coefficient of angle θ . Remember 2π is a full circle.

Answer the Study Questions

Sine Array

GRAPH	sine curve graphs in any order
POINT PAIR	coordinate points match to graph
EQUATION	all points in the table make the equation stay balanced
AMPLITUDE	match coefficient of function to amplitude number
PERIOD	use n : period as $\frac{1}{n} : 2\pi$ when n represents the coefficient of angle θ .

Answer the Study Questions