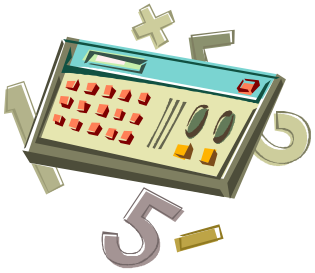
Algebra/Geometry Institute Summer 2004



Lesson Plan 2

Faculty Name: Janice Walker
School: Greenville-Weston
Greenville, MS
Grade Level: Algebra 1 (9th - 10th)

1 Teaching objective(s):

Students will develop a pattern to illustrate a linear function

2 Instructional Activities

I. Finding Interior Angle Sums

Pair students. Distribute, to each pair, one geoboard, 10-12 rubber bands and 2 data sheets. Remind students that the sum of the interior angles of a triangle equals 180^o. Illustrate examples. (draw 50^o,60^o,70^o and 30^o,40^o,110^o triangles). Tell each pair to make a 3-sided figure, triangle, on their geoboard using a rubber band. Demonstrate with the overhead geoboard. Now guide them through question 1a on their data sheet. Next have them make a 4-sided figure, quadrilateral, on their geoboard. Pick one vertex, any vertex, and using other rubber bands, make as many diagonals from that one vertex as possible. Demonstrate on the overhead while emphasizing the terms quadrilateral, diagonal, and vertex. Ask: (1) How many sides did we start with this time? (2) How many triangles were formed? (3) Since each triangle has an interior angle sum of 180^o, what is the sum of the interior angles for the quadrilateral? Have them complete 1b of their data sheet (see attachment #1). Next, students will work with their partner, follow the same procedure for 5 and 6 sided figures while completing c and d of their data sheet. After each pair has finished, have them volunteer answers for c & d, making any corrections necessary.

II. Developing A Pattern

Ask students to briefly discuss with their partner any relationship they may notice within each set of numbers. This relationship should be the same for each set of numbers. Next have a classroom discussion to state the pattern they found for finding the sum of the interior angles.(number of sides – 2)180^o = the sum of the interior angles Tell students this formula has been developed in almost every geometry book they may encounter. Without using the geoboard or your partner, fill in e & f of the data sheet. Allow about 1 minute. While students are doing this, connect the overhead graphing calculator and it's LCD panel. Go over answers. Record this pattern (formula) under number 2 of their data sheet.

III. Graphing Linear Functions

Make sure each student has a graphing calculator. Tell students we will now graph our input and output values using the table feature of the calculator. First, ask them what do they think the graph will look like?

Instructions for graphing:

1. go to "Y =" and input (X-2)180
2. set window x:1 – 15, scale 1, y:100-2000, scale 200.
3. graph
4. discuss graph: pointing out it is a line
5. use trace to explore the line
6. ask students why the only values on the line that are of interest to us, in this situation, are whole number values of x greater than 3.
7. use the table feature to generate other values

Discuss the fact that many of the formulas we use in class are linear functions.
Ask: Do they think the formula for the circumference of a circle is linear or not?
Graph $C = 2\pi r$ ($y = 2\pi x$).
Finally, graph $P = 4s$ ($y = 4x$) perimeter of a square.
Record these formulas on your data sheet.

IV. Assignment

Have students write the assignment from the overhead and begin working.
(see attachment # 2)
If time permits, go over answers before class ends.
If time runs out, go over answers at the beginning of class tomorrow.

3 Materials and Resources

geoboards, rubber bands, data sheets, graphing calculator,
overhead projector, graphing calculator LCD panel,
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Algebra 1, McDougal Littell, copyright 2001

4 Assessment

student response-listen to students oral response on questions asked
observation-walk around and observe groups working together,
and notice answers written on data sheet
calculator assignment-have students draw their responses to
the calculator assignment on the board

Attachment # 1
Data Sheet

Name_____Date_____

1.

number of sides	a.	b.	c.	d.	e. 7	f. 8
number of triangles						
sum of the interior angles						

2. Record the pattern (formula) you found for finding the sum of the interior angles.

_____

3. Record other formulas we found to be linear.

4. Briefly describe the graphical characteristics of a linear function.

Attachment # 2

Assignment

Using your calculator, determine which of the following are linear functions.
Draw a simple graph for each one to demonstrate what the graph looks like.
Label each one as “linear” or “non-linear”

1. $y = |x|$
2. $y = x^3$
3. $y = \left(\frac{9}{5}\right)X + 32$
4. $y = \left(\frac{4}{3}\right)\pi x^3$
5. $y = -6x + 2$
6. $y = \sqrt{x}$
7. $y = x$