Algebra/Geometry Institute Summer 2003

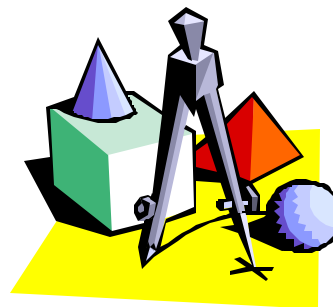Lesson Plan 3
Faculty Name: Ruth Dotson
School: Broad Street High School
City: Shelby, MS
Grade Level: 8

1   Teaching objective(s)
         Model absolute value and basic operations with real numbers.

2   Instructional Activities
         The teacher will: Use tape to display a number line on the floor at the front
          of the classroom. Ask a student to start at 0 and walk to positive 6
          along the number line making one step per number. Ask the student
          to count his/her steps to 6. Ask student to count his/her steps to
          negative 6. Explain to students that the absolute value of a number is the
          total distance that number is from zero. The absolute value of 6 and $-6 = 6$.

          Explain negative and positive integers and how they may be used in real life
          situations. Review the vocabulary terms that represent negative numbers,
          (difference, loss, down, decrease, south, below, etc.). Review the
          vocabulary terms for positive numbers, (increase, plus, gain, north, sum,
          up, above, etc.).

          Show students how to graph points on the number line. Allow students to
          use the same number line to add and subtract integers. Have a student
          demonstrate $4 + 7$ on the number line. The student will walk from 0 to 4
          along the number line in the positive direction and stop. Then walk 7 more
          steps in the positive direction to show the answer 11. Allow a student to
          demonstrate $-5 + 8$. The student will start at 0, walk five steps to -5,
          turn, and walk 8 steps in the positive direction. The student will stop on
          the number 3.

          Show students how to multiply and divide integers. Explain that 8 x 9 is 8
          sets of 9(s) which is 72. Explain that -4 x 8 is 8 sets of -4 (s). Explain
          $12 \div 4$ is 12 divided into four sets. Each set contains 3.

Show students how to use fraction models to add, subtract, multiply, and divide fractions with like or unlike denominators. Show students models of fractions with like denominators, so they can see that $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$, not $\frac{2}{9}$. Demonstrate $\frac{1}{2} + \frac{1}{4}$. Show students that $\frac{1}{2}$ is equivalent to $\frac{2}{4}$. Students can see that the answer will be $\frac{3}{4}$.

Model $\frac{3}{5}$ x $\frac{1}{4}$. Shade in 3 of 5 parts of a whole with one color, and 1 of 4 parts of the same whole with another color. The color combination should be 3 0ut of 20 which = $\frac{3}{20}$. Show students how to divide fractions. Use fraction models to show students that $\frac{3}{4}$ divided into 2 sections = $\frac{3}{8}$.

Show students how to add, subtract, multiply, and divide decimals. Use a grid to show 0.27 + 0.3. Tell students that 100 squares represent 1 whole. Students will see that 0.27 + 0.3 = 0.57. They will also see that 0.3 = 0.30. Show the model 0.45 ÷ 9. Explain to students that if 45 small squares are divided into 9 sections, there will be 5 small squares in each section. The answer is 5 hundredths.

Show students how to find the square roots of numbers with or without the use of a calculator. Use counters to demonstrate 8 x 8 by adding 8 counters in 8 Rows. Students will see that there are 64 counters. Explain to students that the $\sqrt{64}$ = 8, because 8 x 8 = 64. Show 5 x 5 using counters. Have students add 5 rows of 5 counters. They can see that there are 25 counters. Explain to student that the square root of 25 = 5, because 5 x 5 = 25. Allow student to use the calculator to check their work, and to find the square root of numbers that are not perfect squares.

I. Find the absolute value.

1. $|10|$ 2. $|-2.1|$ 3. $-|-6|$ 4. $\left|-\frac{5}{6}\right|$

II. Simplify the expressions.

    5. − 12 x 3   6. − 6 x − 4   7. − (−32) + 19

    8. Find the difference of 25 − 7.34.

    9. Find the product of 6.62 x 0.04.

    10. Find the quotient of 144 ÷ 0.12

V. Write addition expressions for each.

    11. The temperature drops 7 degrees and then rises 11 degrees.

    12. George gains 9 pound, loses 6 pounds, and gains 12 pounds.

VI. Find the square root. Check your work with a calculator.

    13. $\sqrt{225}$ 14. $\sqrt{87}$ 15. $\sqrt{62.5}$

3   Materials and Resources

   Merrill Mathematics textbook, Merrill Publishing Co.
   Fraction models
   Paper
   Pencil
   Calculator
   Overhead
   Grid

4   Assessment

   Student demonstration
   Class work
   Oral response