

Montlake Math Challenge

November 6, 2008

Logic Problems

Problem 1: Magic Squares

Fill in the following square using the numbers 1-9 so that the sum of the numbers across each row, down each column, and along each diagonal is exactly 15.

Problem 2: As an incentive for doing your math homework, Mr. Schultz offers you the following plan during the month of November:

- On November 1, you get one cent for turning in your math homework,
- On November 2, you get two cents for turning in your math homework,
- On November 3, you get four cents for turning in your math homework,
- On November 4, you get eight cents for turning in your math homework,

and so on. For each day you turn in your math homework, Mr. Schultz will give you twice as much money as you got the day before. On the other hand, Steve and Sam will give you one thousand dollars per day for doing your math homework. Whose offer should you take?

Problem 3: John, Paul, George, and Ringo need to cross a bridge at night. They only have one flashlight, and at most two people can cross the bridge at once. It takes John one minute to cross the bridge. It takes Paul two minutes to cross the bridge. It take George eight minutes to cross the bridge. It takes Ringo ten minutes to cross the bridge. What is the shortest amount of time it will take for all four Beatles to cross the bridge?

Problem 4: Harry and Ron are sitting 20 miles apart on their broomsticks. They start flying towards each other at a speed of ten miles per hour. At the same time that they start flying, Hedwig flies from Harry's broomstick to Ron's broomstick. When Hedwig reaches Ron's broomstick, she immediately turns around and flies back to Harry. Hedwig keeps flying back and forth between Harry and Ron without stopping. If Harry and Ron fly at a rate of 5 miles per hour and Hedwig flies at a rate of 12 miles per hour, how far will Hedwig fly before Harry and Ron meet?

Problem 5: You have three jugs. One holds 4 gallons of water, one holds 7 gallons of water, and one holds 10 gallons of water. The jugs don't have any markings on them. How can you measure exactly 9 gallons of water?

Problem 6: Put either a plus sign or minus sign between the following numbers to make a true equation:

$$1 \quad 9 \quad 8 \quad 6 \quad 3 \quad 5 \quad 1 \quad = \quad 6$$

***Challenge Problem**

Here is another magic square. Fill the squares using the numbers 1-16 so that the sum of the numbers across each row, down each column, and along each diagonal is equal to 34.
