

## Math 5: Handout 16

### Math Battle.

1. Cut a  $3 \times 9$  rectangle into 8 squares (not necessarily equal).
2. Solve the equation

$$2019 - 2(2019 - 2(2019 - 2x)) = x$$

3. Clowns Bim, Bam, and Bom are performing in red, blue, and green shirts. Their shoes are also red, blue, and green. Bim's shoes and shirt are of the same color. Bom doesn't have anything red on him. Bam's shoes are green, unlike his shirt. Which color are Bim's and Bom's shoes and shirts?
4. A canister of water has more than 10 liters of water. Is it possible to get exactly 6 liters using a 9- and 5-liter buckets?
5. In the kitchen, there are three pots. The 8qt pot is filled with fruit punch, and the 3qt and 5qt ones are empty. Is it possible to divide fruit punch in half? (You cannot pour fruit punch away!)
6. Imagine that there are 9 coins, and one of them is fake and is lighter than the rest. Using balance scales, how many weighings do you need to find a fake coin? What about 27 coins?
7. A father had 5 sons. He left them a bag of gold coins and following will:
  - the first son should get half of all the coins plus half a coin
  - the second son should get half of all the remaining coins plus half a coin
  - ...
  - the last son should get half of all remaining coins and half a coin

After the sons carried his instructions, each of them got his coins, they never needed to cut a coin in halves, and no coins were left. Can you determine how many coins the father left his sons?