Math Circles   10-6-18   Elementary

WARM UP

1 - GUESS THE NUMBER
Use the clues below, in order, to try to guess the number. (You might not need all of them.)
CLUES:
- It is a three-digit whole number
- Its tens digit is 5
- It is divisible by 4
- It is divisible by 9
- Each of its digits is different
- Its ones digit is greater than its tens digit
- Its hundreds digit is greater than its ones digit
- It is less than 800
- It is divisible by 7
- Its ones digit is 6

MORE LOGIC

2 – Ms. Linda has dogs. All but two of them are Labradors. All but two of them are Poodles. All but two of them are Beagles. How many dogs does she have altogether?

3 – Tom has three cardboard boxes in his room. One contains bottle caps, another contains marbles and the third box contains both marbles and bottle caps. Sal plays a joke on Tom and changes all the signs on the boxes so that every box has the wrong sign on it. Sal challenges Tom to put the signs on the correct boxes but only allows him to choose one item out of one box. How can Tom do this?

4 – Petunia, Rose and Lily are walking into the science room to work on a project together. There are three flowered lab coats hanging by the door. One has roses on it, another has petunias on it and the last one has lilies on it. They each put on a lab coat. The girl wearing the rose lab coat says "I just noticed that the flowers on our lab coats match our names, but none of us is wearing a lab coat with a flower that matches our own name". "Wow!" says Lily, "you're right!" Given those clues, can you identify who is wearing which lab coat?

5 – Ms. Mary has four red socks and eight blue socks in a drawer. They are in a box in her very dark closet. How many socks should she take out of the box to be sure that she will have a pair of matching socks?

6 – Ms. Linda has special socks for her poodle. She has five red socks, six blue socks and seven white socks. These socks are in a box in a very dark closet. How many socks will she have to take out of the box to be sure that she has four matching socks for her dog?

7 – Alex, Lee, Pat and Kit participated in a math contest. Kit solved more problems than Pat. Lee solved more problems than Kit. Pat solved more problems than Alex. Who solved the most problems?

8 – The magic number must meet all of the following three conditions: A – if the magic number is a multiple of 2 then it must be in the range 50 through 59. B – if the magic number is not a multiple of 3, then it must be in the range 60 through 69. C – if the magic number is not a multiple of 4 then it must be in the range 70 through 79. What is the magic number?

In each of the following problems, each letter represents a digit from 0 to 9. Figure out which digit each letter represents:

9 -   ELF + ELF = FOOL

10 -   EGG + EGG = PAGE

11 -   TOP + TOT = OPT

12 -   SHE + EEL = ELSE

13 -   EWE + DELL = WOODS

14 -   SEED + ICED = SPICE