Logic

October 23, 2008

A book costs $10 plus half of its price. How much does the book cost?

1. Water lylies grow so fast that each day their number (and the part of a pond that they cover) doubles. At the end of 10th day the pond is fully covered. When was it half covered?

2. Given two jars, volumes 3 and 5 liters respectively, measure 1 liter.

3. Given two jars, volumes 4 and 9 liters respectively, measure 6 liters.

4. A bug sits in one corner of a woden cube. What is the shortest way for the bug to reach the opposite corner of the cube moving on the surface only?

5. Is it true that among any 3 numbers you can always choose two so that their sum is even (i.e., divisable by 2).

6. There are apples of three different kinds in a basket. How many apples (at random) do you need to take out to make sure that

   - there are at least two apples of the same kind;
   - there are at least three appples of the same kind;

7. Ann says: "I have more then 10 friends"; Rose replies: " This can't be! You have less then 10 friends." The teacher says: "Ann definitely has at least one friend!".
   Given that exactly one of these statements is true, find how many friends Ann has.

8. Someone found a notebook with 100 statements as follows:

   There is exactly one wrong statement written here;
   There is exactly two wrong statements written here;
   There are exactly three wrong statements written here;
   ....
   There are exactly one hundred wrong statements written here;

   Which of this statements is correct?

9. There are 9 coins, exactly one of which is counterfeit and weights less then the true coins. Using a balance scale and performing no more than 2 weightings, find the counterfeit coin.

10. Same problem as the previous one, but the total number of coins is 8.

11. There are 12 coins, one of which is counterfeit. It is not known whether the counterfeit coin weights more or less then a true coin. All true coins have the same weight. Using three weightings on a balance scale, find the counterfeit coin.