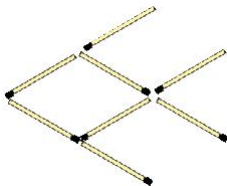# Session 1. Home Assignment.

1. A beaver is cutting a long log using a chain saw. The beaver has made 10 cuts through the log. How many pieces of wood does he have?

2. Relocate 3 matches to make the fish swim to the right.

3. A box contains 14 orange marbles and 10 white marbles. The box is placed into a completely dark room. How many marbles should you take out of the box to guarantee that you have

   - a) two marbles of the same color
   - b) two white marbles

4. A box contains 30 pairs of orange mittens, and 20 pairs of black mittens. Note that mittens in a pair are different - one is for the left hand, and one is for the right. You can take any number of mittens from the box without looking at them. How many mittens should you take out of the box to guarantee that

   - a) you have a pair of mittens of a same color
   - b) you have a pair of black mittens

5. A plane leaves an airport in Anchorage, Alaska and heads straight north. After flying 300 miles it turns and heads directly west for another 300 miles. Then it turns and heads directly south for another 300 miles and east for 300 miles. At this moment, the plain lands. Does it land at the same spot that it took off?
For Teacher: Experience shows that is makes sense to warn students that the answer is "No". Otherwise they'd draw a square with side 300 and stop thinking about the problem.

6. How many elephants and camels do they have in the Zalamazoo Zoo if these animals together have 22 ears and 9 times more humps then trunks? By the way, do you remember that a came has two humps?

   Teacher Note: That is a herder problem. Assingn it to students only is you think that some of them will be able to handle it.