MATH MAGIC AND NUMBERS

1. Predicting The Guess

Let's start with a simple magic trick.

Problem 1.1. *Pick any number between* 1 *and* 10. *Then perform the following steps (show your work on the side!)*
(1) Take your number, and add 5 *to it.*
(2) Take that number, and multiply it by 2.
(3) Take that number, and subtract from it twice the number you picked at the beginning of the game.
(4) Compare your answer with your neigbour.
Do you have the same number? How did the magic trick work?

Having understood the above trick, Can you see a similar trick in the following problem?

Problem 1.2. *Pick any number between* 1 *and* 10. *Then perform the following steps (show your work on the side!)*
(1) *Take your number, and add* 3 *to it.*
(2) *Take that number, and multiply it by* 3.
(3) *Take that number, and subtract from it thrice the number you picked at the beginning of the game.*
(4) *Compare your answer with your neigbour.*
Do you have the same number? How did the magic trick work?

The following problem is also based on the same trick. Try and figure out the magic trick!

Problem 1.3. *Pick any number between* 1 *and* 10. *Then perform the following steps (show your work on the side!)*
(1) *Take your number, and multiply it by* 2.
(2) *Take that number, and add* 8 *to it.*
(3) *Take that number, and divide it by* 2.
(4) *Take that number, and subtract from it the number you picked at the beginning of the game.*
(5) *Compare your answer with your neigbour.*
Do you have the same number? How did the magic trick work? Can you explain this trick to others?